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REFERENCE DATA OF PRESSURE DISTRIBUTION ON THE SURFACES OF AIRFOILS HAVING THE NAMES BEGINNING WITH THE LETTER B

Abstract: *The results of the computer calculation of air flow around the airfoils having the names beginning with the letter B are presented in the article. The contours of pressure distribution on the surfaces of the airfoils at the angles of attack of 0, 15 and -15 degrees in conditions of the subsonic airplane flight speed were obtained.*

Key words: *the airfoil, the angle of attack, pressure, the surface.*

Language: *English*

Citation: Chemezov, D., et al. (2021). Reference data of pressure distribution on the surfaces of airfoils having the names beginning with the letter B. *ISJ Theoretical & Applied Science, 11 (103)*, 1001-1076.

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Introduction

Creating reference materials that determine the most accurate pressure distribution on the airfoils surfaces is an actual task of the airplane aerodynamics.

Materials and methods

The study of air flow around the airfoils was carried out in a two-dimensional formulation by means of the computer calculation in the *Comsol Multiphysics* program. The airfoils in the cross section were taken as objects of research [1-12]. In this work, the airfoils having the names beginning with the letter *B* were adopted. Air flow around the airfoils was carried out at the angles of attack (α) of 0, 15 and -15 degrees. The flight speed of the airplane in each case was subsonic. The airplane flight in the atmosphere was carried out under normal weather conditions. The geometric characteristics of the studied airfoils are presented in the Table 1. The studied geometric shapes of the airfoils in the cross section are presented in the Table 2.

Table 1. The geometric characteristics of the airfoils.

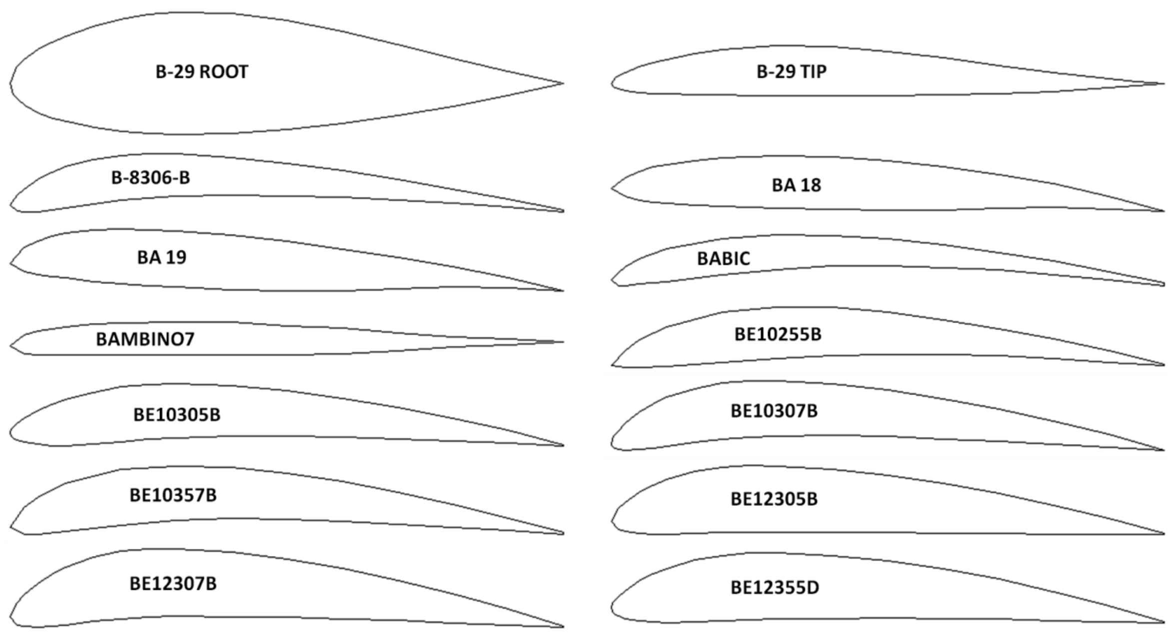
Airfoil name	Max. thickness	Max. camber	Leading edge radius	Trailing edge thickness
B-29 ROOT	21.98% at 30.2% of the chord	1.73% at 30.2% of the chord	3.1357%	0.0%
B-29 TIP	9.00% at 30.0% of the chord	2.23% at 30.0% of the chord	0.5306%	0.0%
B-8306-B	8.09% at 20.0% of the chord	6.67% at 30.0% of the chord	0.9045%	0.35%
BA 18	9.5% at 30.0% of the chord	10.85% at 30.0% of the chord	1.5426%	0.0%
BA 19	9.9% at 30.0% of the chord	8.72% at 10.0% of the chord	1.586%	0.0%
BABIC	6.5% at 20.0% of the chord	6.2% at 40.0% of the chord	0.7642%	0.5%
BAMBINO7	6.0% at 30.0% of the chord	3.0% at 30.0% of the chord	1.5544%	0.0%
BE10255B	9.2% at 30.0% of the chord	6.15% at 40.0% of the chord	1.3133%	0.2%
BE10305B	10.01% at 25.0% of the chord	6.44% at 30.0% of the chord	0.6577%	0.25%
BE10307B	9.95% at 25.0% of the chord	7.49% at 30.0% of the chord	0.6546%	0.0%
BE10357B	9.99% at 20.0% of the chord	7.44% at 40.0% of the chord	1.6997%	0.27%
BE12305B	11.98% at 25.0% of the chord	6.31% at 25.0% of the chord	1.4179%	0.23%
BE12307B	11.97% at 25.0% of the chord	7.92% at 30.0% of the chord	1.4749%	0.25%
BE12355D	11.95% at 25.0% of the chord	6.61% at 30.0% of the chord	0.7379%	0.25%
BE12357B	11.97% at 25% of the chord	7.72% at 40.0% of the chord	1.4928%	0.33%
BE3259B	3.04% at 5.0% of the chord	9.12% at 30.0% of the chord	1.9315%	0.0%
BE3307B	2.95% at 20.0% of the chord	7.18% at 30.0% of the chord	1.4507%	0.12%
BE3309B	2.99% at 20.0% of the chord	9.16% at 30.0% of the chord	0.694%	0.1%
BE3357B	2.95% at 15.0% of the chord	7.19% at 50.0% of the chord	0.5073%	0.15%
BE3359B	2.98% at 25.0% of the chord	9.09% at 30.0% of the chord	0.6117%	0.1%
BE50 (original)	7.27% at 25.0% of the chord	4.81% at 45.0% of the chord	0.6484%	0.26%
BE50 (smoothed)	7.32% at 23.8% of the chord	3.96% at 45.4% of the chord	0.5776%	0.259%
BE5456	5.05% at 30.0% of the chord	5.0% at 40.0% of the chord	0.5963%	0.6%
BE6306B	6.0% at 20.0% of the chord	6.25% at 30.0% of the chord	0.6746%	0.3%
BE6308B	6.12% at 20.0% of the chord	8.3% at 30.0% of the chord	0.7181%	0.28%
BE6356	6.1% at 20.0% of the chord	6.27% at 40.0% of the chord	1.292%	0.22%
BE6356B	6.1% at 20.0% of the chord	6.27% at 40.0% of the chord	0.6768%	0.22%
BE6358B	6.1% at 20.0% of the chord	8.18% at 40.0% of the chord	0.6867%	0.25%
BE6407E	6.05% at 15.0% of the chord	6.93% at 40.0% of the chord	0.765%	0.0%
BE6453B	6.45% at 25.0% of the chord	4.25% at 40.0% of the chord	0.7532%	0.45%
BE6455B	6.35% at 25.0% of the chord	5.08% at 40.0% of the chord	0.6177%	0.5%
BE6456F	6.5% at 20.0% of the chord	6.45% at 40.0% of the chord	0.8198%	0.5%
BE6458	6.05% at 40.0% of the chord	7.98% at 40.0% of the chord	0.7174%	0.7%
BE6556	6.1% at 60.0% of the chord	6.05% at 50.0% of the chord	0.665%	0.6%
BE6556B	6.15% at 30.0% of the chord	6.42% at 50.0% of the chord	0.7091%	0.45%
BE6556C	6.25% at 30.0% of the chord	6.55% at 50.0% of the chord	0.6914%	0.4%
BE6557B	6.05% at 30.0% of the chord	7.5% at 50.0% of the chord	0.7345%	0.5%
BE6606	6.01% at 50.0% of the chord	6.0% at 60.0% of the chord	0.6865%	0.6%
BE7404B	7.35% at 20.0% of the chord	4.6% at 30.0% of the chord	0.8691%	0.45%
BE7455E	6.9% at 20.0% of the chord	5.9% at 40.0% of the chord	0.8467%	0.0%
BE7457D	7.15% at 20.0% of the chord	7.08% at 50.0% of the chord	0.7879%	0.5%
BE7457D2	7.15% at 20.0% of the chord	7.08% at 50.0% of the chord	0.7879%	0.5%
BE7505D	7.6% at 20.0% of the chord	6.58% at 40.0% of the chord	0.452%	0.2%
BE7505E	7.2% at 20.0% of the chord	6.15% at 50.0% of the chord	0.8139%	0.0%
BE8258	8.09% at 20.0% of the chord	8.54% at 30.0% of the chord	1.2213%	0.25%
BE8306	8.09% at 20.0% of the chord	6.67% at 40.0% of the chord	0.9045%	0.35%
BE8306B	8.09% at 20.0% of the chord	6.67% at 30.0% of the chord	0.9045%	0.35%
BE8308B	8.17% at 20.0% of the chord	8.4% at 30.0% of the chord	1.6955%	0.3%
BE8353B	7.7% at 25.0% of the chord	4.42% at 30.0% of the chord	0.2877%	0.4%
BE8353B2	7.7% at 25.0% of the chord	4.35% at 25.0% of the chord	0.7862%	0.4%
BE8356	8.1% at 20.0% of the chord	6.54% at 30.0% of the chord	1.5145%	0.33%

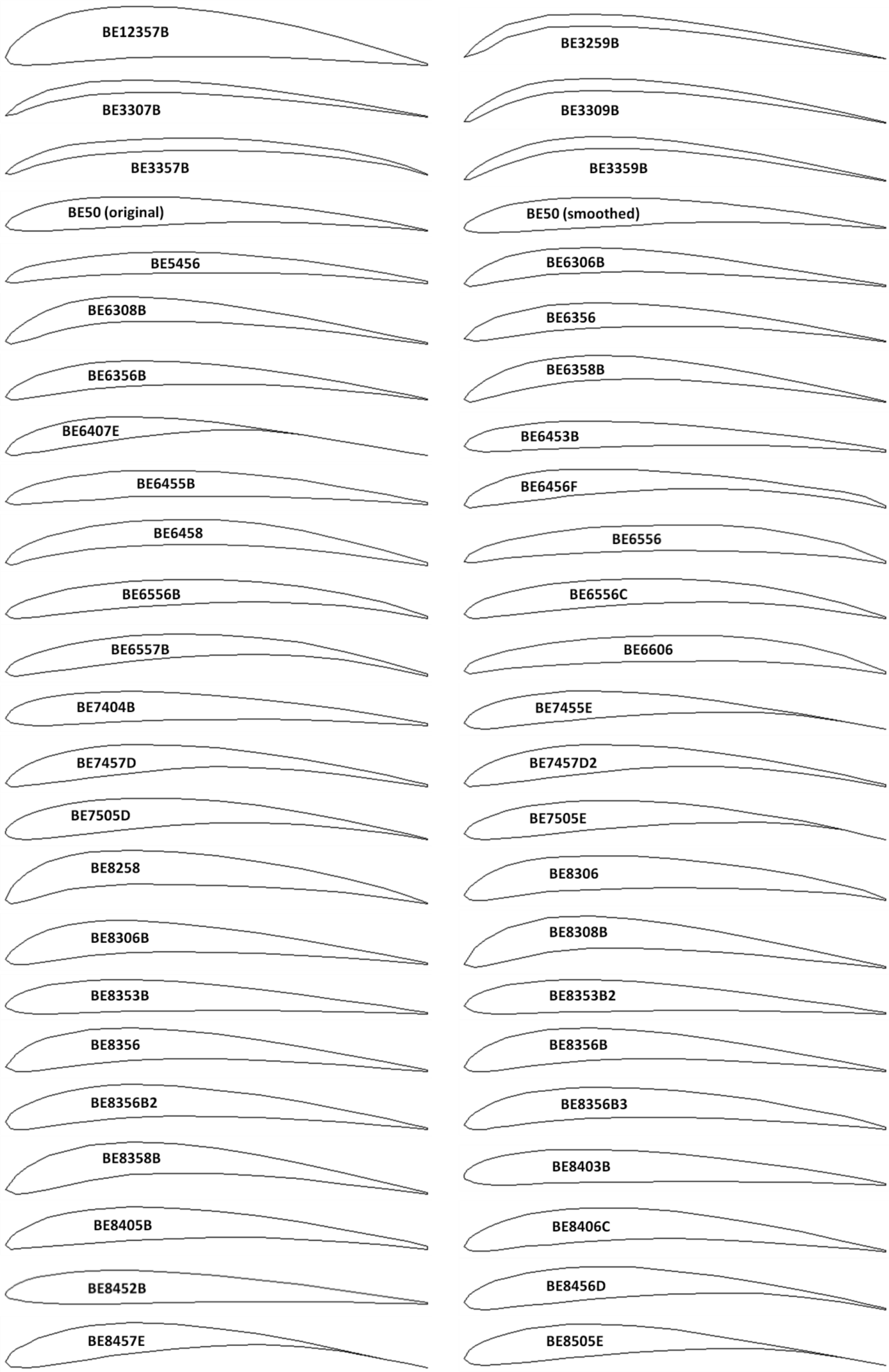
BE8356B	8.1% at 20.0% of the chord	6.54% at 30.0% of the chord	0.893%	0.33%
BE8356B2	8.02% at 20.0% of the chord	6.8% at 30.0% of the chord	1.238%	0.33%
BE8356B3	7.45% at 20.0% of the chord	6.4% at 40.0% of the chord	0.8385%	0.5%
BE8358B	8.2% at 20.0% of the chord	8.4% at 30.0% of the chord	1.5721%	0.3%
BE8403B	7.95% at 25.0% of the chord	4.58% at 30.0% of the chord	0.8174%	0.35%
BE8405B	7.95% at 25.0% of the chord	6.13% at 40.0% of the chord	0.904%	0.7%
BE8406C	8.0% at 20.0% of the chord	6.72% at 40.0% of the chord	0.8799%	0.4%
BE8452B	7.95% at 25.0% of the chord	4.05% at 30.0% of the chord	0.31%	0.4%
BE8456D	8.0% at 20.0% of the chord	6.68% at 40.0% of the chord	1.0068%	0.3%
BE8457E	8.0% at 20.0% of the chord	7.45% at 40.0% of the chord	1.0527%	0.0%
BE8505E	8.0% at 20.0% of the chord	6.17% at 40.0% of the chord	0.9738%	0.0%
BE8556B	7.7% at 30.0% of the chord	6.97% at 50.0% of the chord	1.505%	0.6%
BE9304B	8.9% at 25.0% of the chord	5.05% at 25.0% of the chord	0.5013%	0.25%
BE9403B	8.95% at 20.0% of the chord	4.63% at 30.0% of the chord	0.6775%	0.45%
BE9404B	9.25% at 25.0% of the chord	5.45% at 30.0% of the chord	0.6768%	0.0%
BELL 540	9.71% at 22.1% of the chord	0.0% at 0.0% of the chord	1.4922%	0.41%
Bell AH-1	9.71% at 22.1% of the chord	0.0% at 0.0% of the chord	1.4922%	0.41%
BELL-WORTMANN FX 69-H-083	8.4% at 33.3% of the chord	2.44% at 33.3% of the chord	0.2895%	0.19%
BELL-WORTMANN FX 69-H-098	9.89% at 28.2% of the chord	1.74% at 22.4% of the chord	0.599%	0.22%
Benedek 10355 B	9.9% at 30.0% of the chord	6.43% at 30.0% of the chord	1.2071%	0.24%
Benedek 1053 B	10.01% at 25.0% of the chord	6.44% at 30.0% of the chord	0.9557%	0.25%
Benedek 12355 B	11.95% at 25.0% of the chord	6.61% at 30.0% of the chord	1.233%	0.25%
Benedek 7406 F	7.25% at 20.0% of the chord	6.35% at 40.0% of the chord	0.9017%	0.95%
Benedek 8353 B-2	7.7% at 25.0% of the chord	4.42% at 30.0% of the chord	0.7862%	0.4%
Benedek 8405 A	8.03% at 25% of the chord	6.89% at 40.0% of the chord	1.2155%	0.28%
Benedek 8406 B	8.06% at 25.0% of the chord	7.13% at 40.0% of the chord	1.3431%	0.33%
Benedek 8406 C	8.0% at 20.0% of the chord	6.72% at 40.0% of the chord	1.0754%	0.4%
Benedek 9304 B	8.9% at 35.0% of the chord	5.05% at 25.0% of the chord	0.9249%	0.25%
Benedek 9403 B	8.95% at 20.0% of the chord	4.63% at 30.0% of the chord	1.0802%	0.45%
Benedek 9404 B	9.25% at 25.0% of the chord	5.45% at 30.0% of the chord	1.0257%	0.0%
Bergey BW-3 (smoothed)	5.02% at 7.4% of the chord	5.79% at 41.6% of the chord	1.1768%	0.6617%
Blanchard WB135/35	13.55% at 25.0% of the chord	3.75% at 50.0% of the chord	1.0142%	0.0%
Blanchard WB140/35/FB	13.93% at 30.0% of the chord	3.7% at 45.0% of the chord	1.096%	0.5%
BO 545-310	10.0% at 30.0% of the chord	4.95% at 40.0% of the chord	1.0094%	0.0%
BO 560-38	8.0% at 30.0% of the chord	5.0% at 60.0% of the chord	0.7486%	0.0%
BOBWHITE	6.3% at 22.2% of the chord	4.95% at 50.0% of the chord	0.713%	1.6%
BOEING	10.07% at 40.0% of the chord	1.73% at 78.0% of the chord	1.4372%	0.136%
BOEING 103	12.72% at 30.0% of the chord	3.6% at 40.0% of the chord	1.5187%	0.12%
BOEING 106	13.06% at 30.0% of the chord	3.34% at 40.0% of the chord	1.3888%	0.04%
BOEING 707 ,08 SPAN	11.43% at 24.0% of the chord	0.23% at 6.0% of the chord	2.6475%	0.0%
BOEING 707 ,19 SPAN	12.16% at 30.1% of the chord	0.73% at 10.1% of the chord	0.9337%	0.0%
BOEING 707 ,40 SPAN	9.58% at 30.0% of the chord	1.9% at 15.0% of the chord	0.9012%	0.0%
BOEING 707 ,54 SPAN	8.97% at 40.0% of the chord	2.0% at 30.0% of the chord	0.3861%	0.0%
BOEING 707 ,99 SPAN	9.01% at 42.0% of the chord	1.78% at 34.0% of the chord	0.4675%	0.0%
BOEING 707 .08 SPAN AIRFOIL	11.43% at 24.0% of the chord	0.22% at 6.0% of the chord	2.6461%	0.0%
BOEING 707 .19 SPAN AIRFOIL	12.16% at 30.1% of the chord	0.73% at 10.1% of the chord	0.9341%	0.0%
BOEING 707 .54 SPAN AIRFOIL	8.97% at 40.0% of the chord	2.0% at 30.0% of the chord	0.3861%	0.0%
BOEING 707 .99 SPAN AIRFOIL	9.01% at 42.0% of the chord	1.78% at 34.0% of the chord	0.4676%	0.0%
BOEING 737 MIDSPAN	10.0% at 40.0% of the chord	1.45% at 20.4% of the chord	0.3443%	0.1%
BOEING 737 MIDSPAN AIRFOIL	12.54% at 25.0% of the chord	1.54% at 7.2% of the chord	1.7443%	0.08%
BOEING 737 MIDSPAN AIRFOIL-b	10.0% at 40.0% of the chord	1.45% at 20.4% of the chord	0.3443%	0.1%
BOEING 737 OUTBOARD	10.8% at 40.0% of the chord	1.58% at 20.0% of the chord	0.5016%	0.16%
BOEING 737 OUTBOARD AIRFOIL	10.8% at 40.0% of the chord	1.58% at 20.0% of the chord	0.5016%	0.16%
BOEING 737 ROOT	15.37% at 19.5% of the chord	1.91% at 4.9% of the chord	3.8212%	0.06%
BOEING 737 ROOT AIRFOIL	15.37% at 19.5% of the chord	1.91% at 4.9% of the chord	3.8212%	0.06%
Boeing B-29 root airfoil	21.98% at 30.2% of the chord	1.73% at 30.2% of the chord	3.1372%	0.0%
Boeing B-29 tip airfoil	9.0% at 30.0% of the chord	2.23% at 30.0% of the chord	0.5303%	0.0%
BOEING BACXXX	11.31% at 35.0% of the chord	1.4% at 15.0% of the chord	0.5653%	0.08%
Boeing Commercial Airplane Company airfoil J	10.07% at 40.0% of the chord	1.73% at 78.0% of the chord	1.4417%	0.136%

Boeing Commercial Airplane Company BACXXX	11.31% at 35.0% of the chord	1.4% at 15.0% of the chord	0.5653%	0.08%
BOEING VERTOL V(1,95)3009-1,25	9.0% at 29.9% of the chord	1.3% at 19.9% of the chord	0.9852%	0.11%
BOEING VERTOL V13006-,7	5.98% at 30.1% of the chord	0.91% at 20.1% of the chord	0.4754%	0.12%
BOEING VERTOL V43012-1,58	12.04% at 32.0% of the chord	3.67% at 15.0% of the chord	1.8955%	0.0%
BOEING VERTOL V43015-2,48	15.03% at 30.0% of the chord	3.68% at 15.0% of the chord	2.4422%	0.0%
BOEING10	12.72% at 30.0% of the chord	5.28% at 30.0% of the chord	1.3978%	0.12%
BOEING16	13.06% at 30.0% of the chord	5.35% at 30.0% of the chord	1.379%	0.03%
BOEING-VERTOL V23010-1,58	10.18% at 30.0% of the chord	1.75% at 15.0% of the chord	1.3868%	0.0%
BOEING-VERTOL VR-1	10.97% at 35.3% of the chord	1.53% at 43.3% of the chord	1.3672%	0.0%
BOEING-VERTOL VR-11X	10.97% at 40.0% of the chord	2.42% at 25.0% of the chord	1.1288%	0.3%
BOEING-VERTOL VR-12	10.57% at 35.0% of the chord	2.28% at 20.0% of the chord	0.8713%	0.3%
BOEING-VERTOL VR-13	9.45% at 35.0% of the chord	2.04% at 20.0% of the chord	0.6814%	0.2684%
BOEING-VERTOL VR-14	7.96% at 35.0% of the chord	1.72% at 20.0% of the chord	0.4598%	0.226%
BOEING-VERTOL VR-15	7.96% at 35.0% of the chord	1.29% at 20.0% of the chord	0.5486%	0.2389%
BOEING-VERTOL VR-5	12.0% at 35.0% of the chord	3.4% at 35.0% of the chord	0.796%	0.08%
BOEING-VERTOL VR-7	12.03% at 33.0% of the chord	3.12% at 33.0% of the chord	1.1055%	0.5%
BOEING-VERTOL VR-8	8.07% at 34.7% of the chord	1.26% at 34.7% of the chord	0.5681%	0.5%
BOEING-VERTOL VR-9	6.06% at 35.0% of the chord	0.33% at 35.0% of the chord	0.4711%	0.0%
Borge' B3	11.7% at 30.0% of the chord	5.85% at 30.0% of the chord	1.2661%	0.0%
BP4D	10.16% at 29.0% of the chord	1.68% at 36.8% of the chord	1.1709%	0.078%
Broggini 55509	9.2% at 20.0% of the chord	5.0% at 25.0% of the chord	1.2236%	0.0%
Brogly	9.1% at 30.0% of the chord	5.8% at 40.0% of the chord	1.2498%	0.0%
BRUXEL33	12.99% at 30.0% of the chord	6.5% at 30.0% of the chord	2.217%	0.0%
BRUXEL36	16.23% at 30.0% of the chord	8.12% at 30.0% of the chord	3.0597%	0.0%
BTP8	7.95% at 19.9% of the chord	0.0% at 0.0% of the chord	0.7248%	0.0%

Note:
Bell AH-1 (operational loads survey, rotor blade airfoil, modified NACA 0012);
Blanchard WB135/35 (R/C sailplane airfoil 13.5% smooth), *Blanchard WB140/35/FB* (R/C sailplane airfoil 14%);
BO 545-310 (W. Bogart (USA));
BOEING 707 ,08 SPAN AIRFOIL, *BOEING 737 ROOT AIRFOIL* (Boeing Commercial Airplane), *Boeing Commercial Airplane Company BACXXX* (BACXXX Energy Efficient Transport Program Airfoil);
Borge' B3 (C. Borge' (France));
Broggini 55509 (C. Broggini (Italy));
Brogly (R. Brogly (France)).

Table 2. The geometric shapes of the airfoils in the cross section.

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BE3307B
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BE50 (original)
BE50 (smoothed)
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BE6308B
BE6356
BE6356B
BE6358B
BE6407E
BE6453B
BE6455B
BE6456F
BE6458
BE6556
BE6556B
BE6556C
BE6557B
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BE7404B
BE7455E
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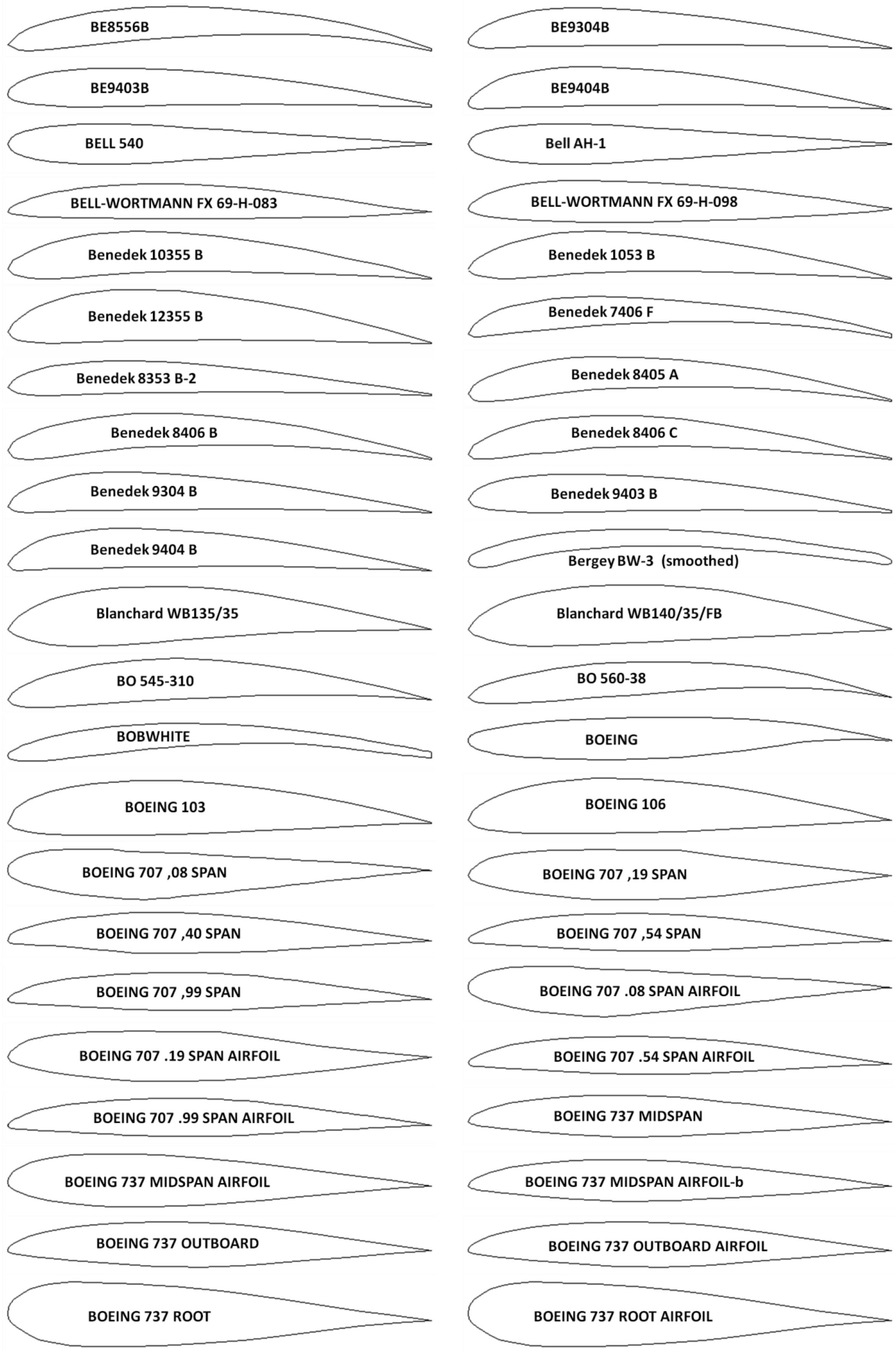
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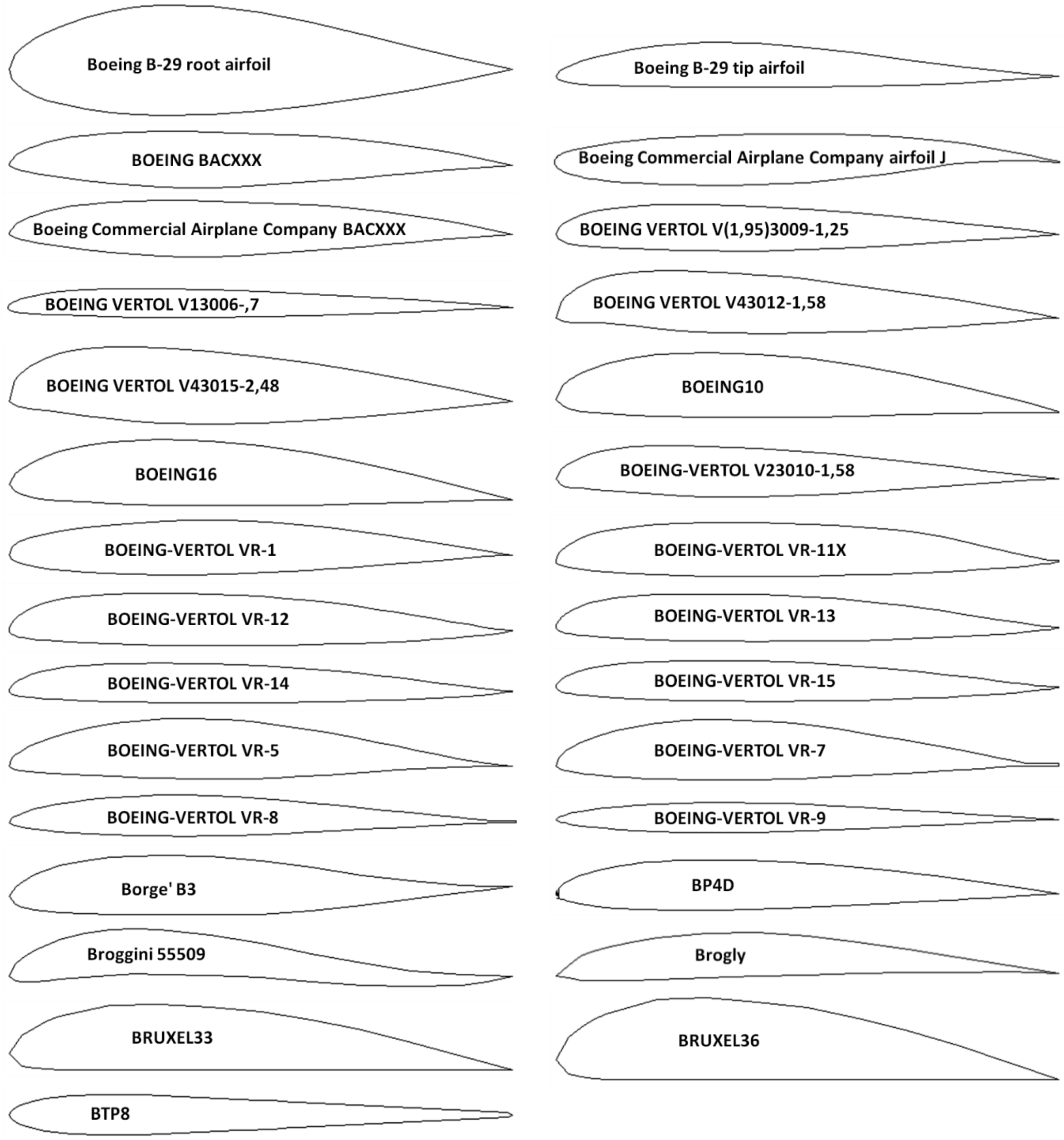
BE9304B
BE9403B
BE9404B
BELL 540
Bell AH-1
BELL-WORTMANN FX 69-H-083
BELL-WORTMANN FX 69-H-098
Benedek 10355 B
Benedek 1053 B
Benedek 12355 B
Benedek 7406 F
Benedek 8353 B-2
Benedek 8405 A
Benedek 8406 B
Benedek 8406 C
Benedek 9304 B
Benedek 9403 B
Benedek 9404 B
Bergey BW-3 (smoothed)
Blanchard WB135/35
Blanchard WB140/35/FB
BO 545-310
BO 560-38
BOBWHITE
BOEING
BOEING 103
BOEING 106
BOEING 707 ,08 SPAN
BOEING 707 ,19 SPAN
BOEING 707 ,40 SPAN
BOEING 707 ,54 SPAN
BOEING 707 ,99 SPAN
BOEING 707 .08 SPAN AIRFOIL
BOEING 707 .19 SPAN AIRFOIL
BOEING 707 .54 SPAN AIRFOIL
BOEING 707 .99 SPAN AIRFOIL
BOEING 737 MIDSPAN
BOEING 737 MIDSPAN AIRFOIL
BOEING 737 MIDSPAN AIRFOIL-b
BOEING 737 OUTBOARD
BOEING 737 OUTBOARD AIRFOIL
BOEING 737 ROOT
BOEING 737 ROOT AIRFOIL



Results and discussion

The calculated pressure contours on the surfaces of the airfoils at the different angles of attack are presented in the Figs. 1-135. The calculated magnitudes on the scale can be represented as the basic magnitudes when comparing the pressure drop under conditions of changing the angle of attack of the airfoils.

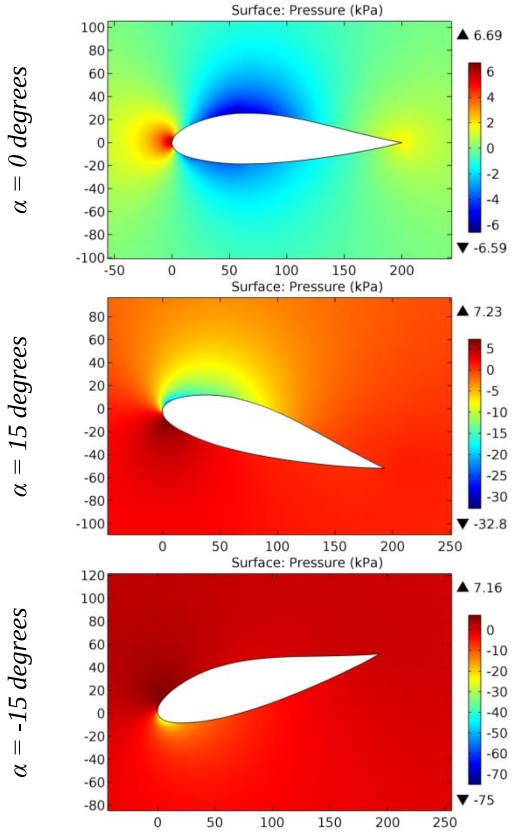


Figure 1. The pressure contours on the surfaces of the B-29 ROOT airfoil.

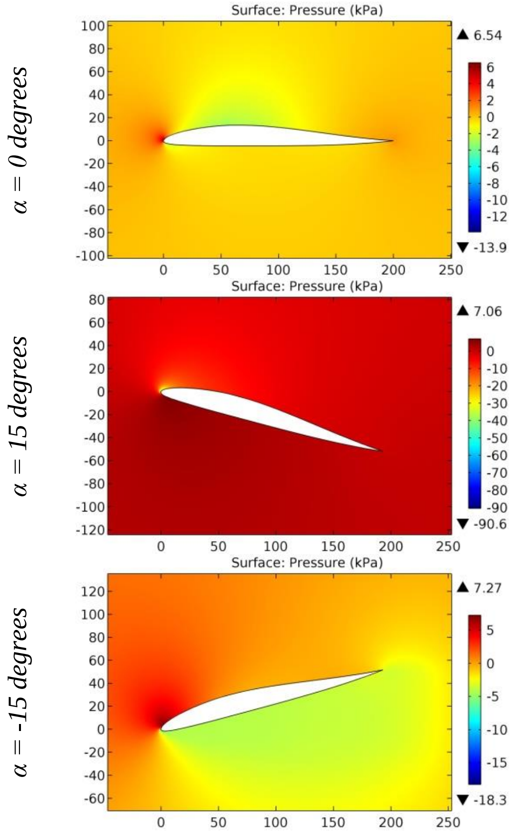


Figure 2. The pressure contours on the surfaces of the B-29 TIP airfoil.

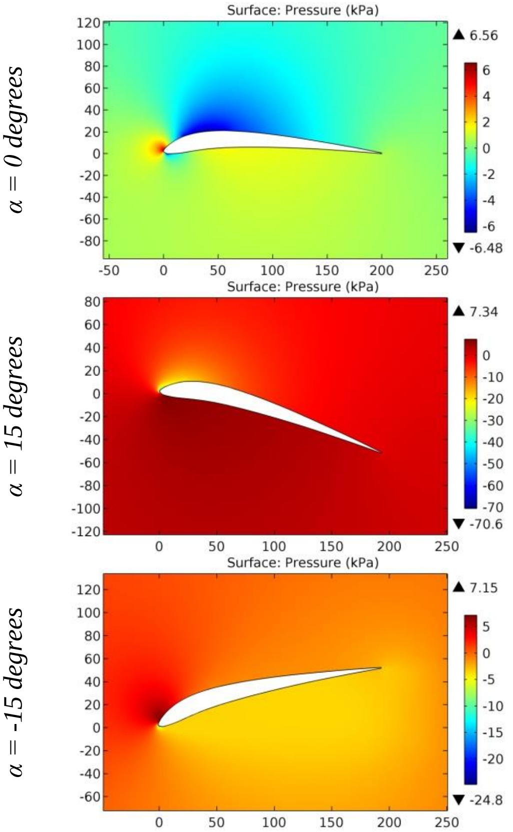


Figure 3. The pressure contours on the surfaces of the B-8306-B airfoil.

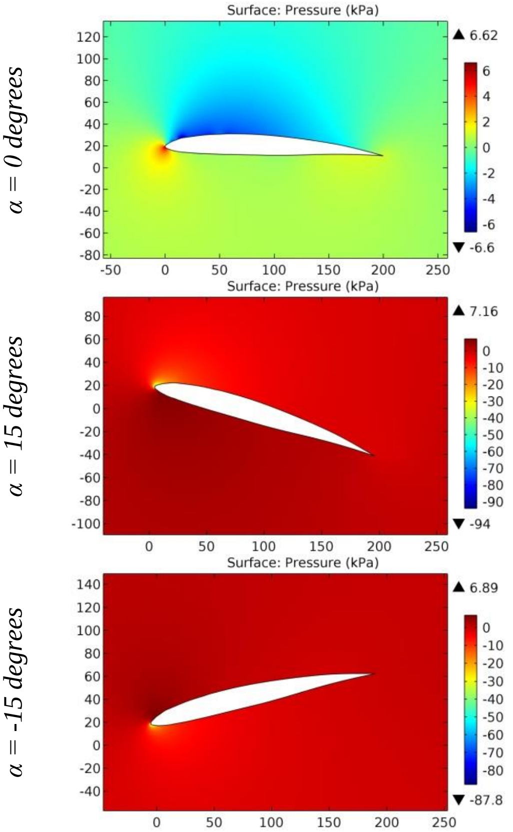


Figure 4. The pressure contours on the surfaces of the BA 18 airfoil.

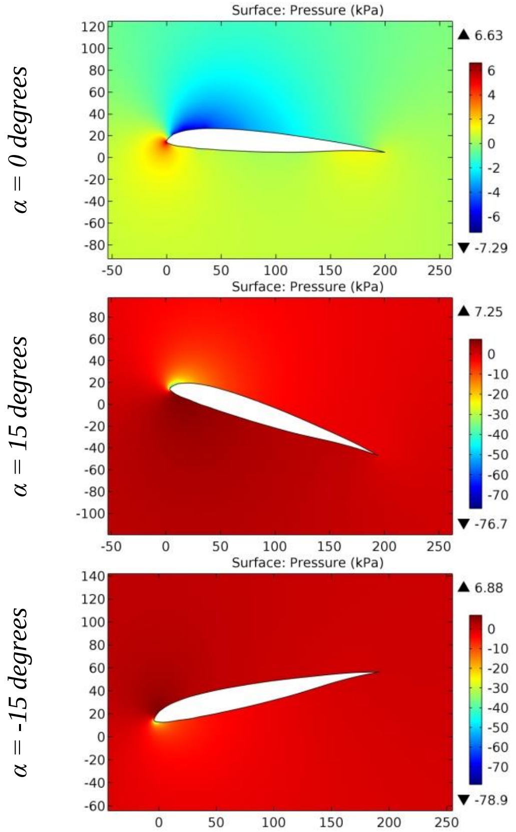


Figure 5. The pressure contours on the surfaces of the BA 19 airfoil.

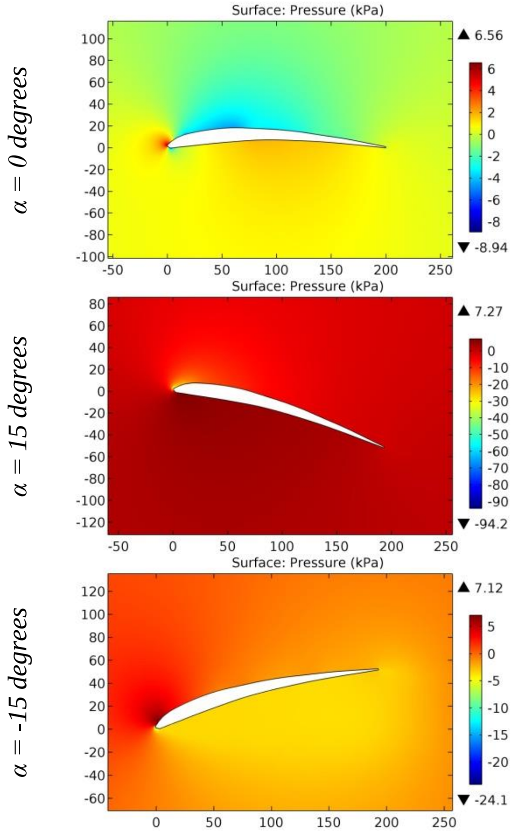


Figure 6. The pressure contours on the surfaces of the BABIC airfoil.

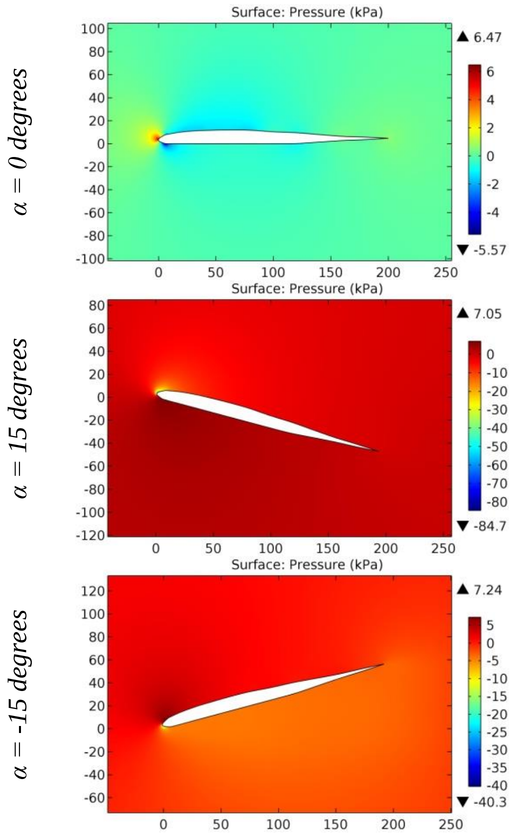


Figure 7. The pressure contours on the surfaces of the BAMBINO7 airfoil.

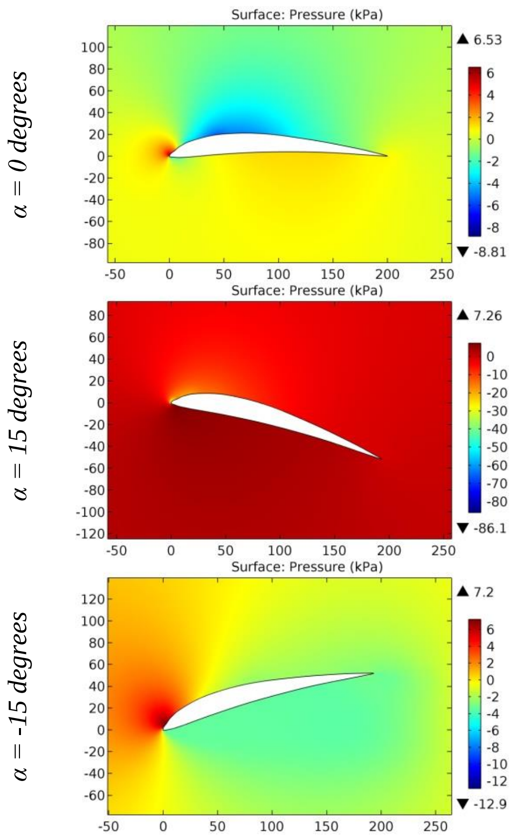


Figure 8. The pressure contours on the surfaces of the BE10255B airfoil.

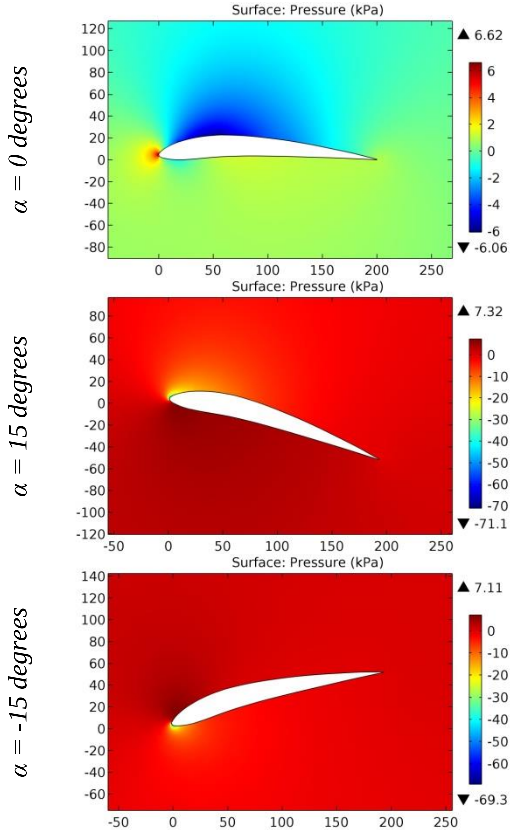


Figure 9. The pressure contours on the surfaces of the BE10305B airfoil.

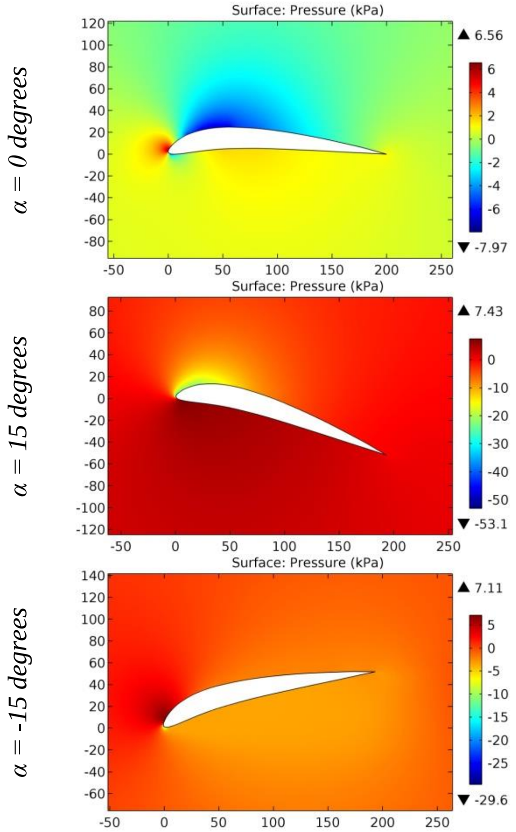


Figure 10. The pressure contours on the surfaces of the BE10307B airfoil.

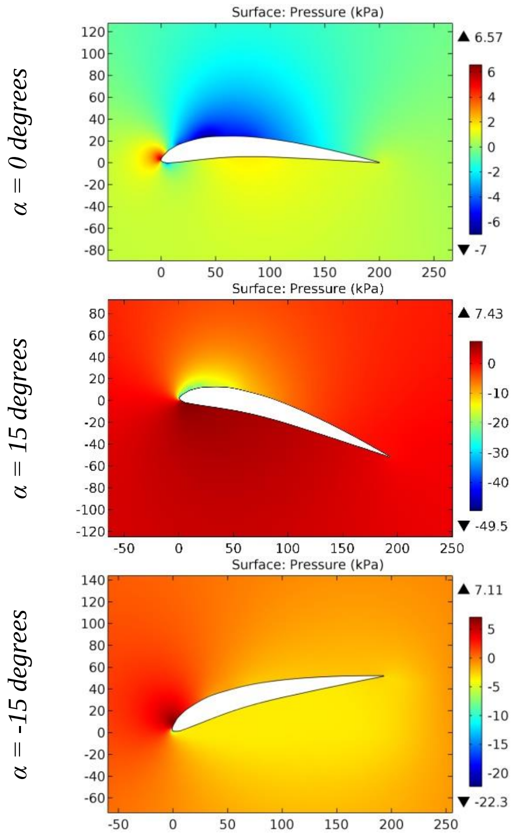


Figure 11. The pressure contours on the surfaces of the BE10357B airfoil.

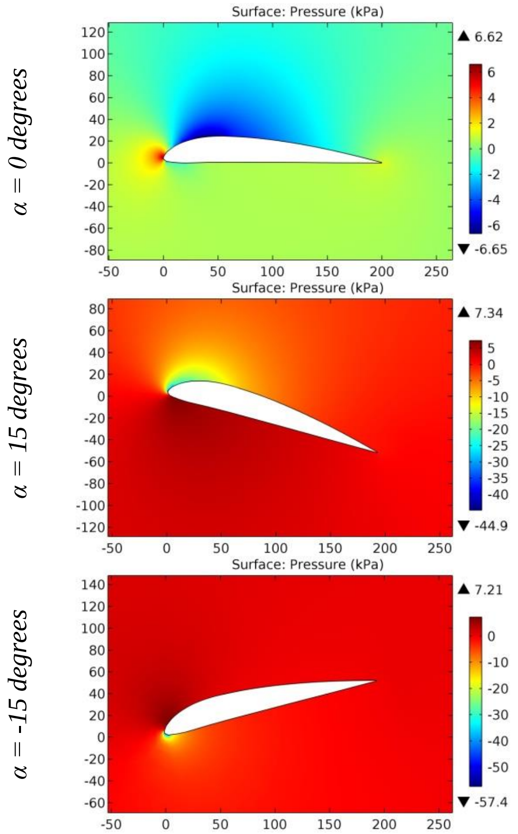


Figure 12. The pressure contours on the surfaces of the BE12305B airfoil.

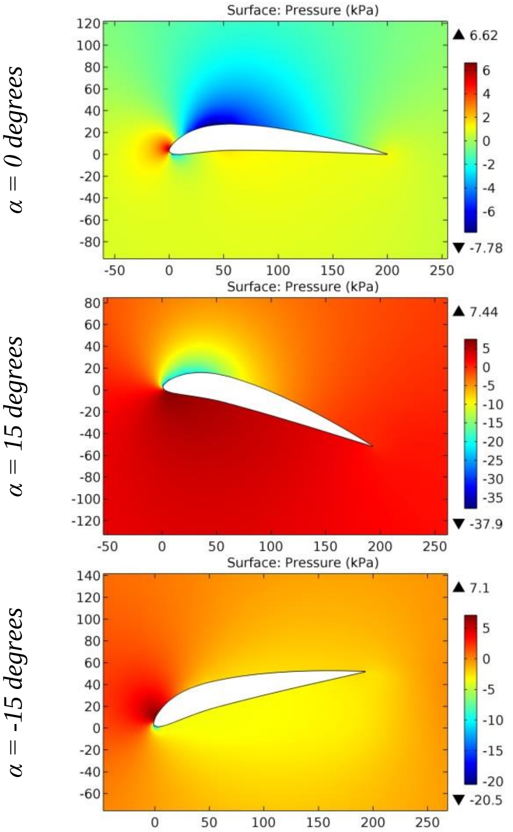


Figure 13. The pressure contours on the surfaces of the BE12307B airfoil.

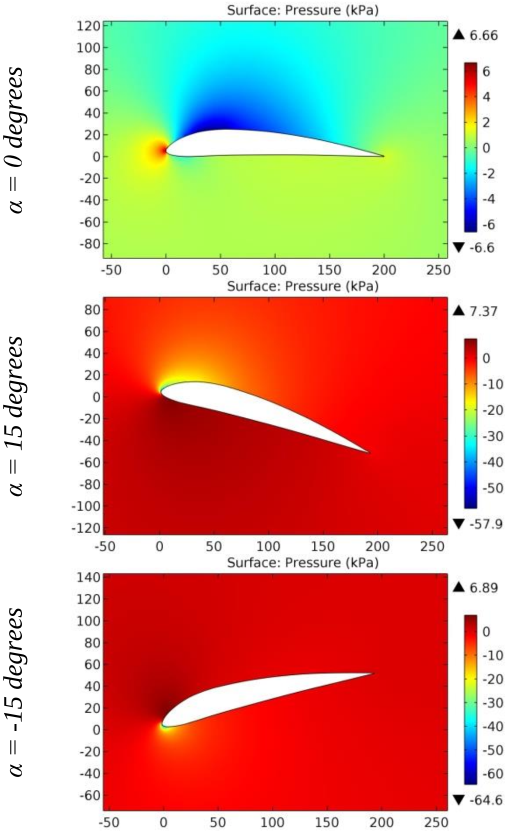


Figure 14. The pressure contours on the surfaces of the BE12355D airfoil.

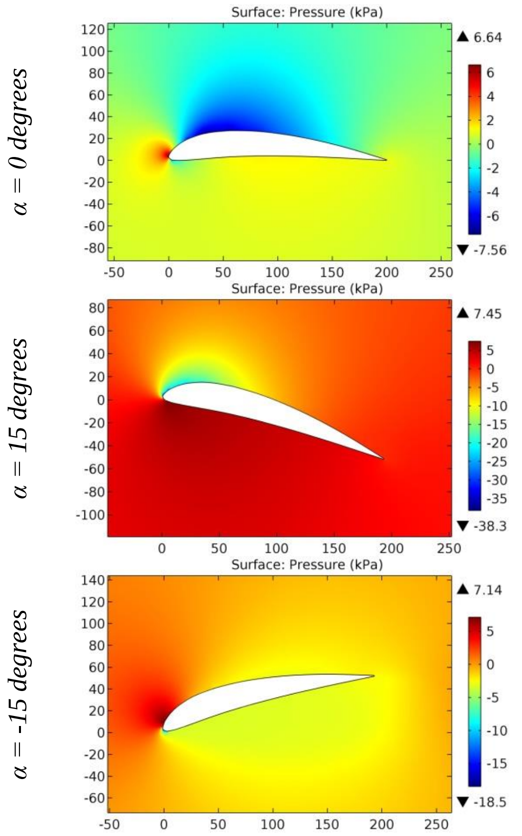


Figure 15. The pressure contours on the surfaces of the BE12357B airfoil.

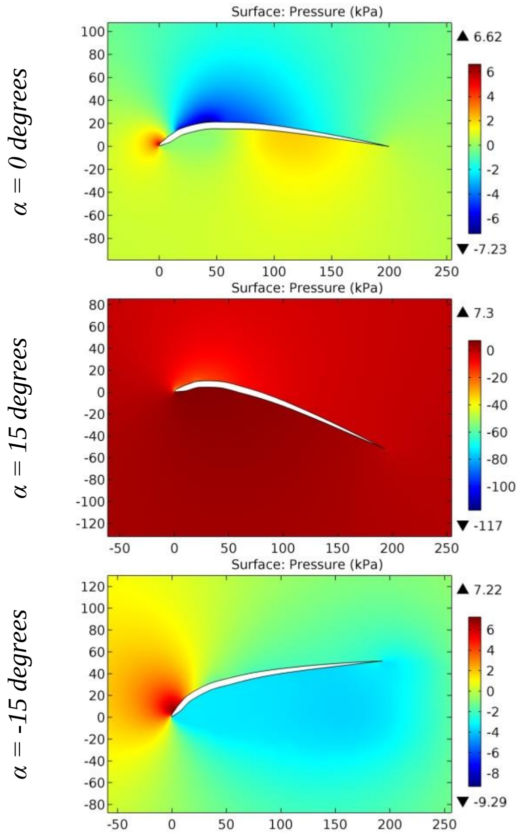


Figure 16. The pressure contours on the surfaces of the BE3259B airfoil.

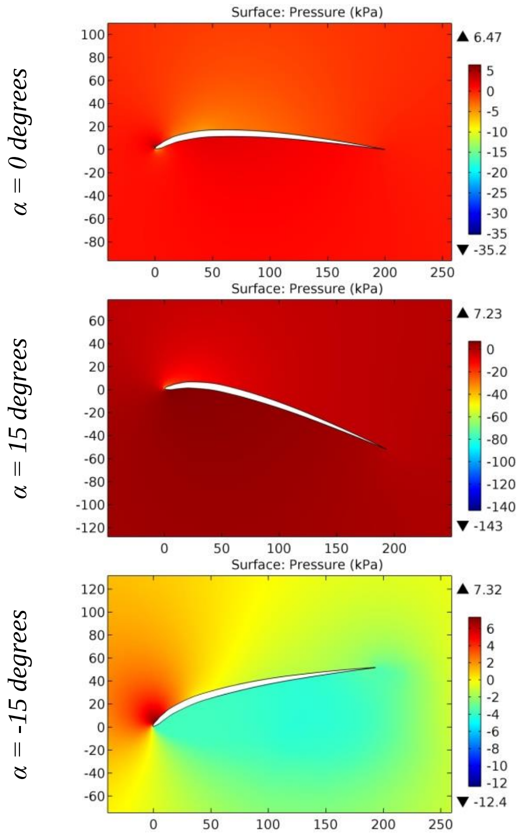


Figure 17. The pressure contours on the surfaces of the BE3307B airfoil.

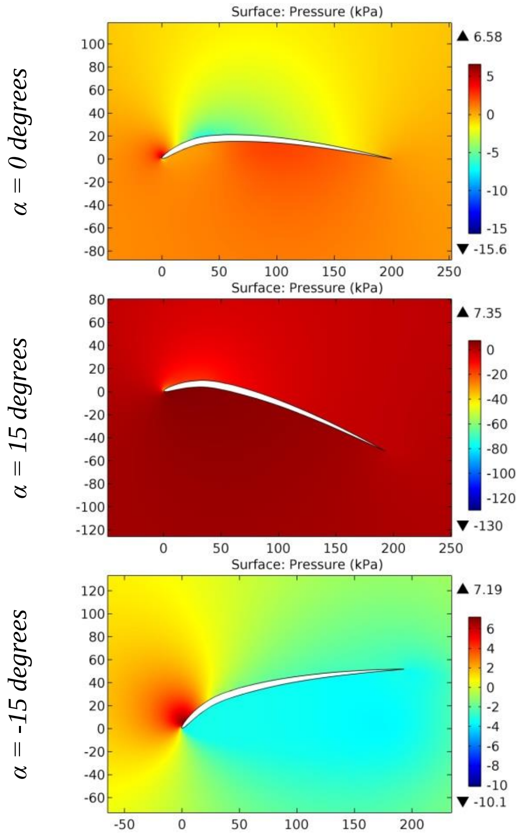


Figure 18. The pressure contours on the surfaces of the BE3309B airfoil.

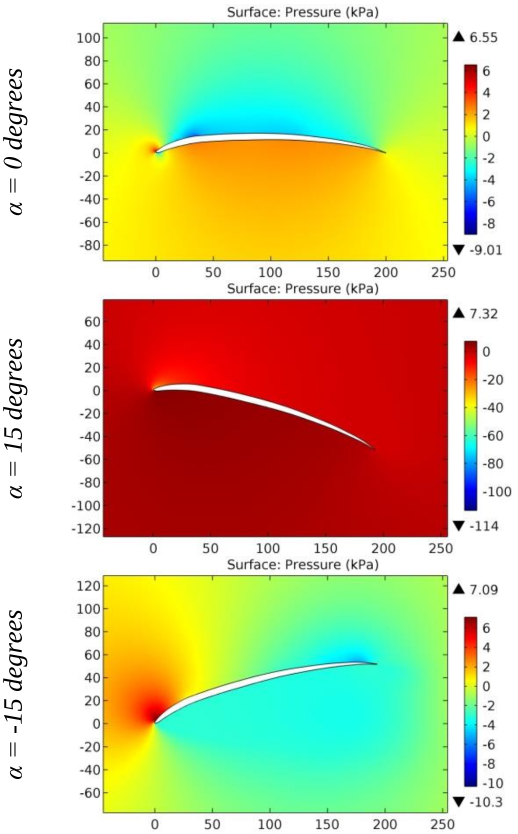


Figure 19. The pressure contours on the surfaces of the BE3357B airfoil.

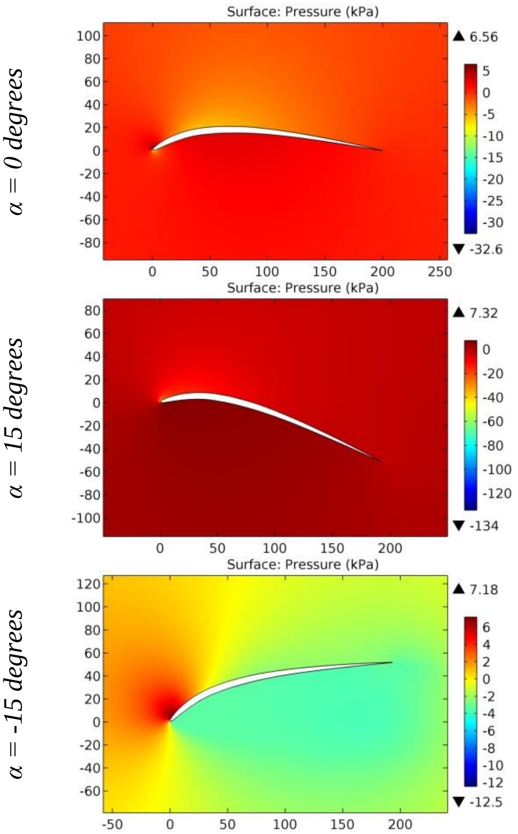


Figure 20. The pressure contours on the surfaces of the BE3359B airfoil.

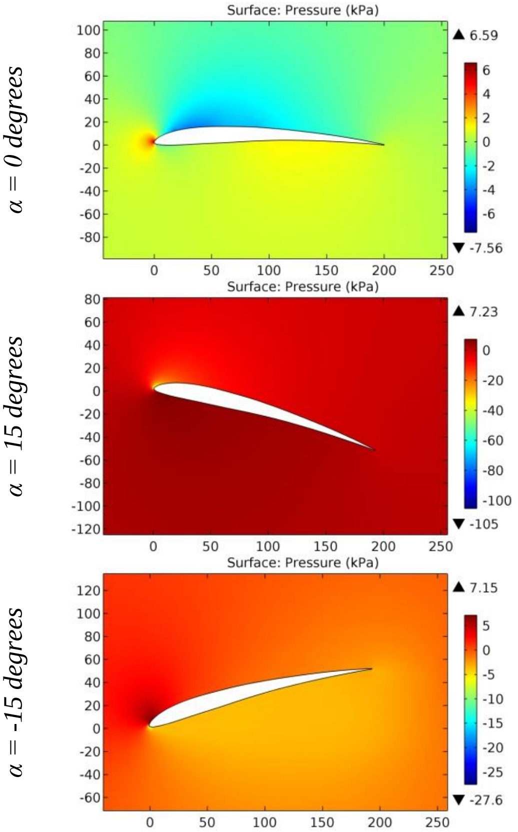


Figure 21. The pressure contours on the surfaces of the BE50 (original) airfoil.

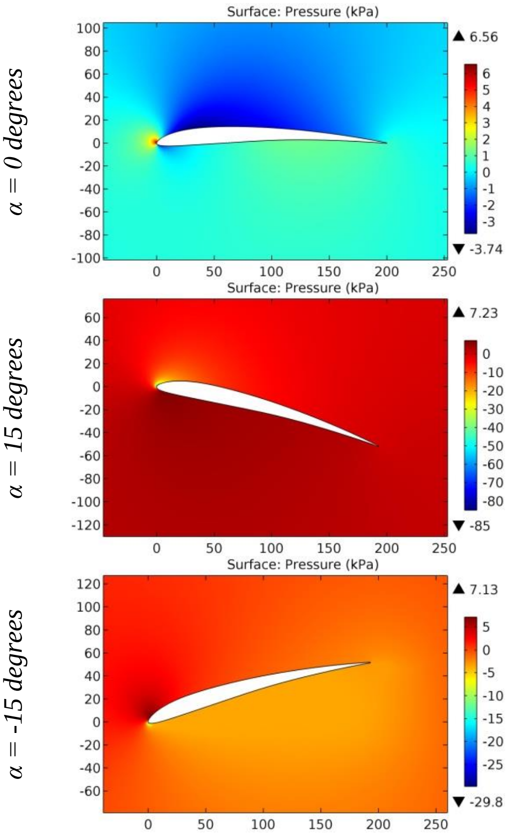


Figure 22. The pressure contours on the surfaces of the BE50 (smoothed) airfoil.

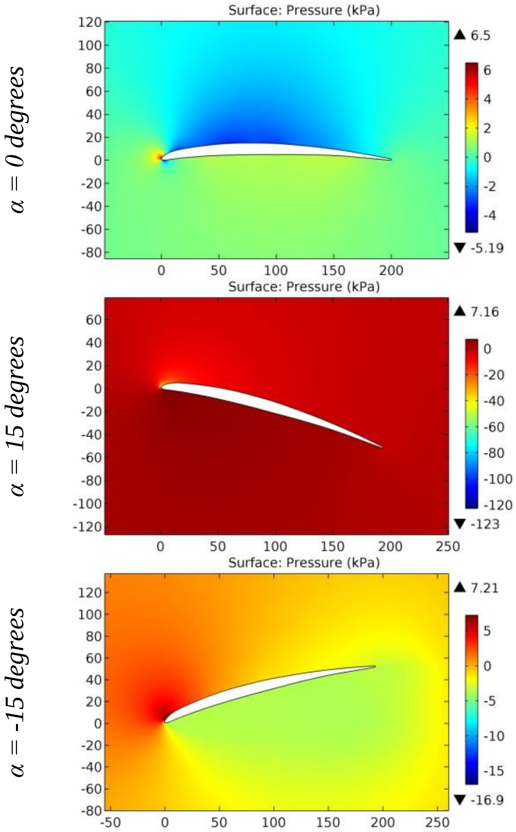


Figure 23. The pressure contours on the surfaces of the BE5456 airfoil.

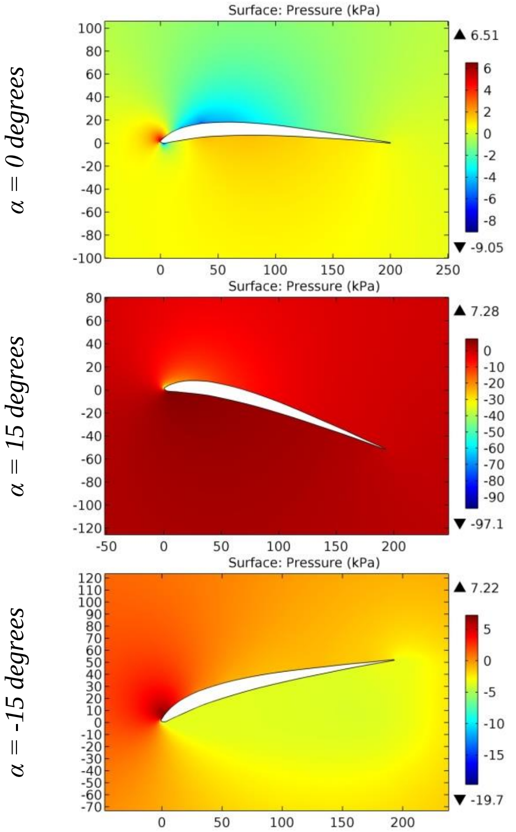


Figure 24. The pressure contours on the surfaces of the BE6306B airfoil.

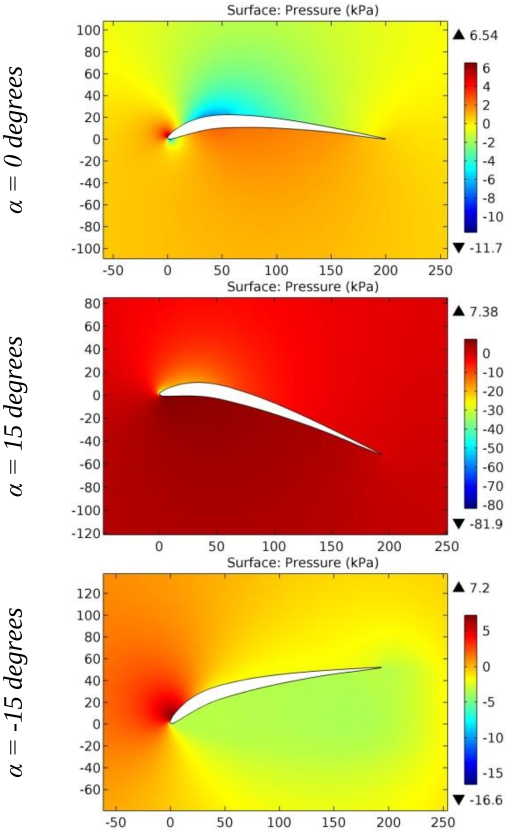


Figure 25. The pressure contours on the surfaces of the BE6308B airfoil.

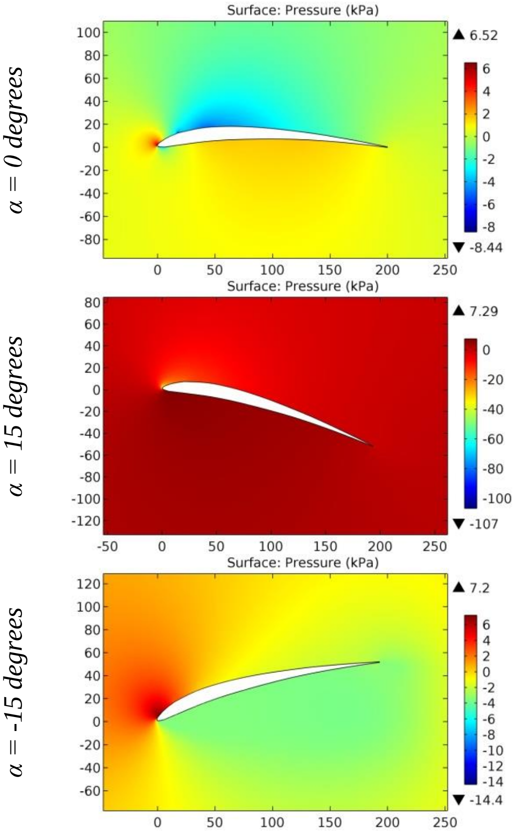


Figure 26. The pressure contours on the surfaces of the BE6356 airfoil.

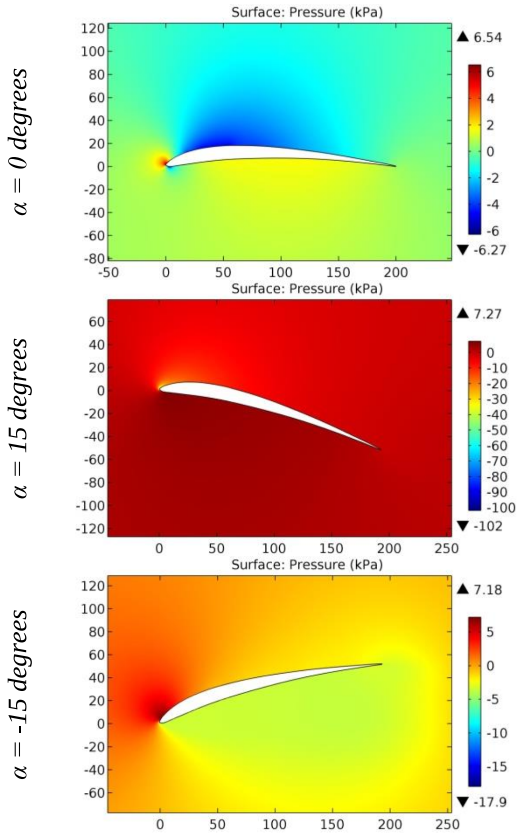


Figure 27. The pressure contours on the surfaces of the BE6356B airfoil.

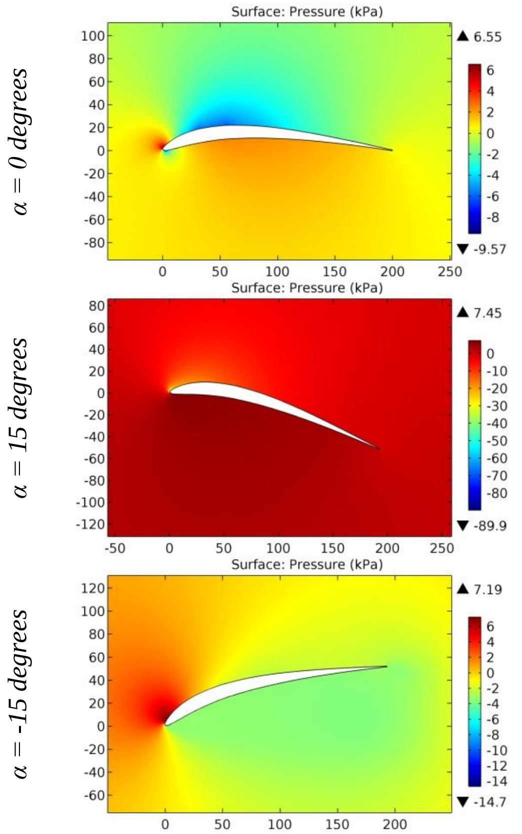


Figure 28. The pressure contours on the surfaces of the BE6358B airfoil.

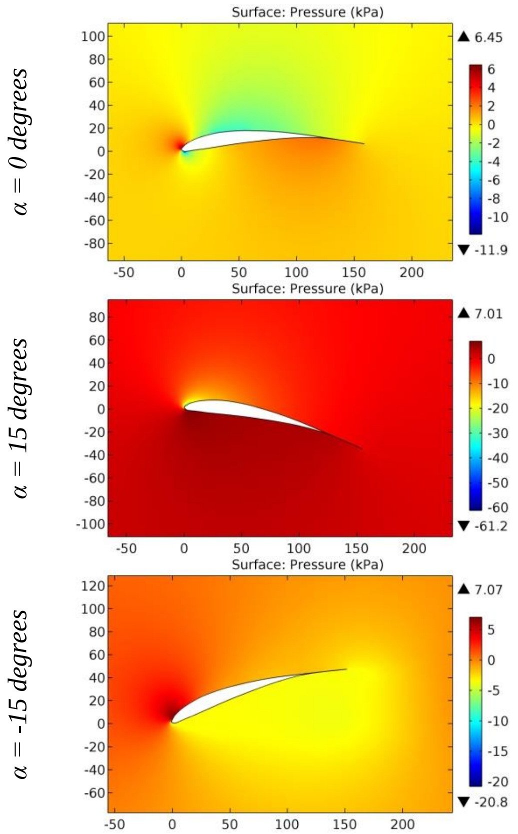


Figure 29. The pressure contours on the surfaces of the BE6407E airfoil.

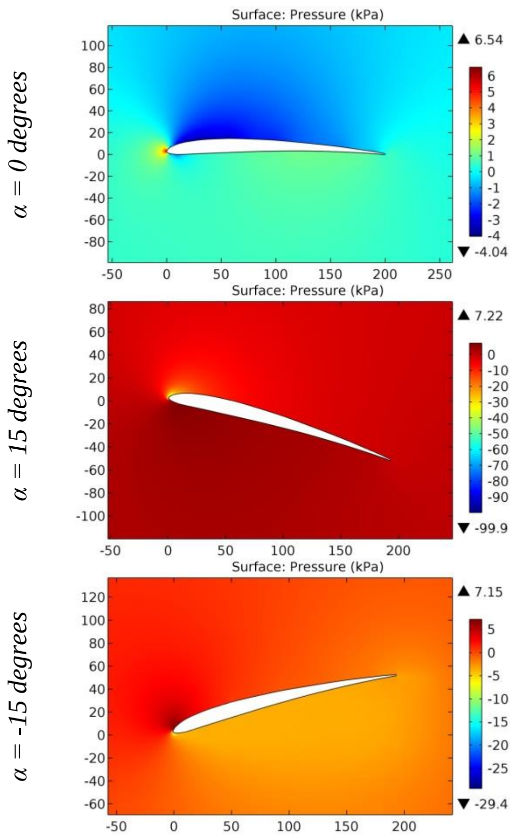


Figure 30. The pressure contours on the surfaces of the BE6453B airfoil.

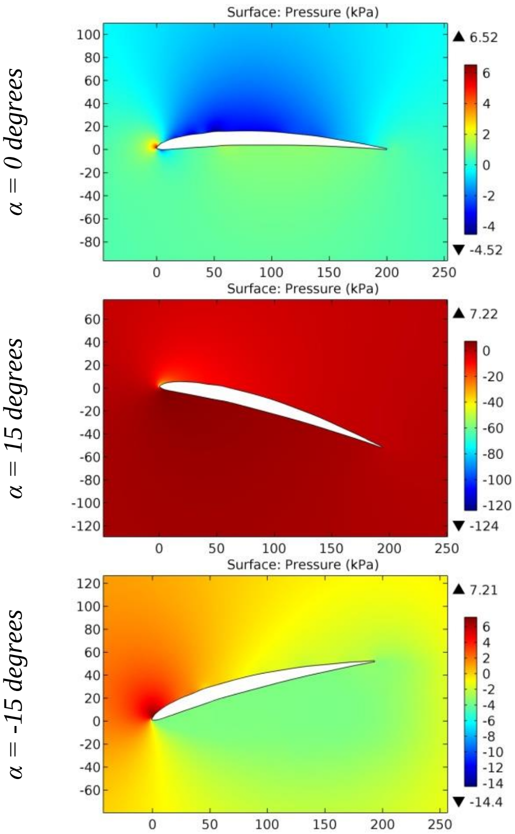


Figure 31. The pressure contours on the surfaces of the BE6455B airfoil.

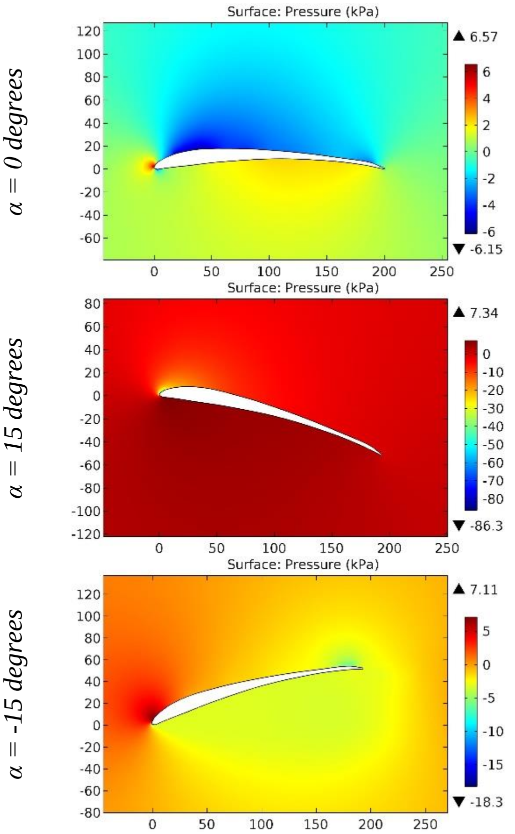


Figure 32. The pressure contours on the surfaces of the BE6456F airfoil.

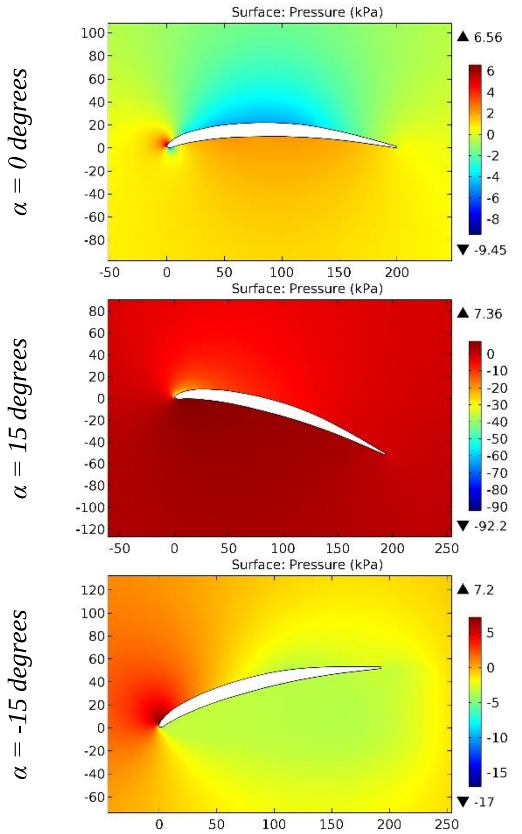


Figure 33. The pressure contours on the surfaces of the BE6458 airfoil.

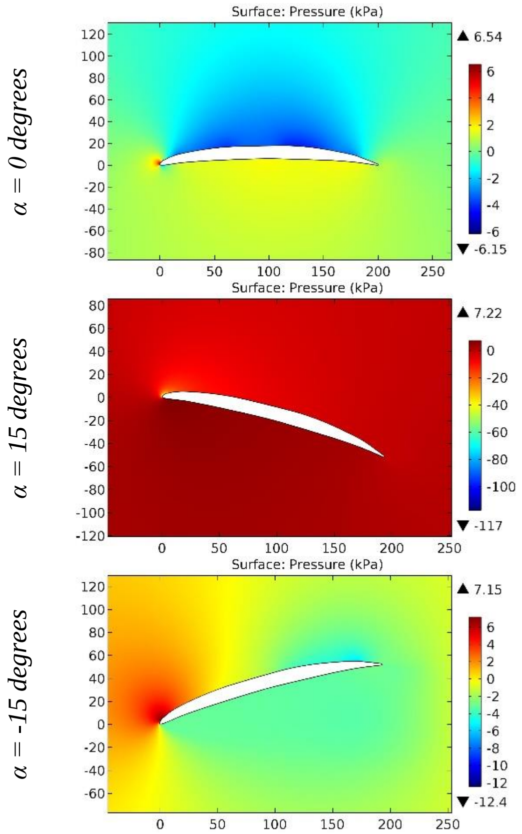


Figure 34. The pressure contours on the surfaces of the BE6556 airfoil.

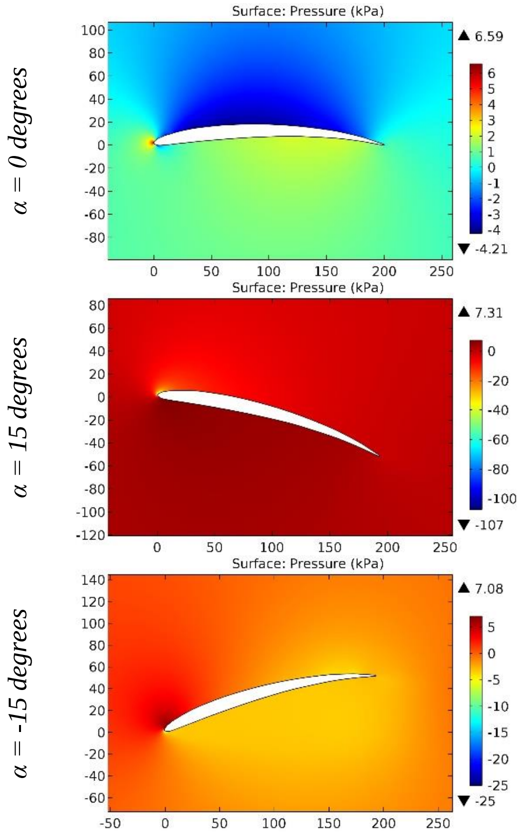


Figure 35. The pressure contours on the surfaces of the BE6556B airfoil.

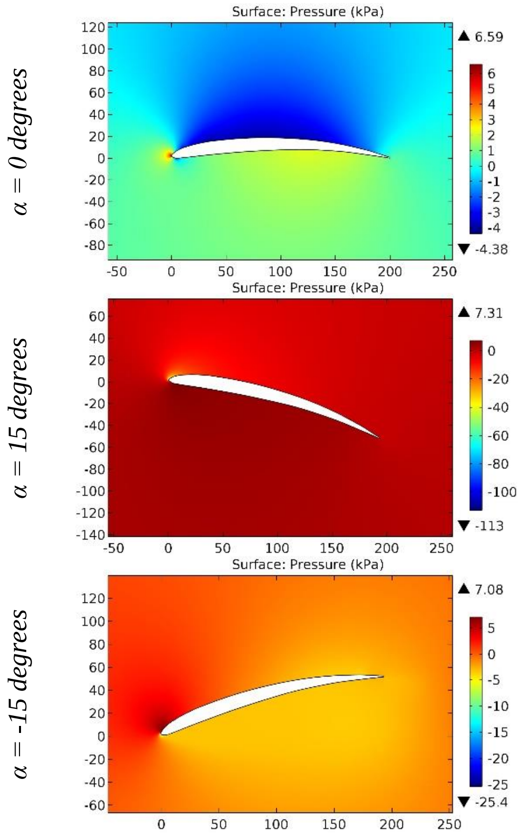


Figure 36. The pressure contours on the surfaces of the BE6556C airfoil.

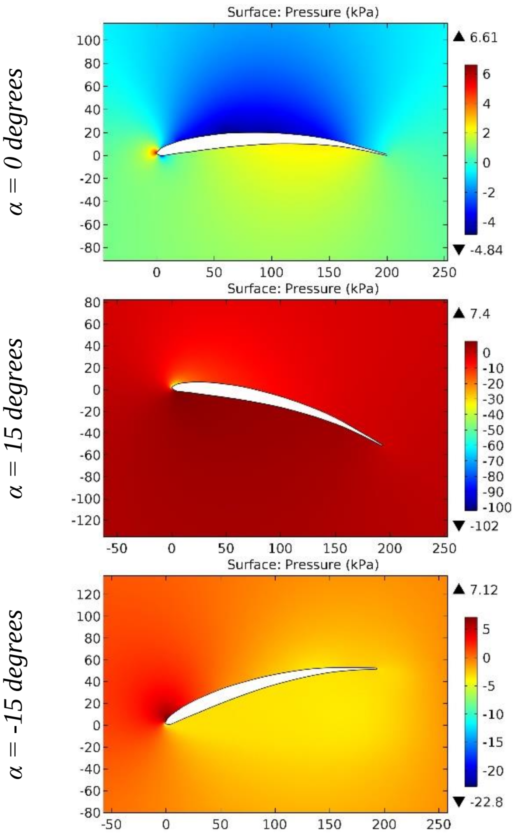


Figure 37. The pressure contours on the surfaces of the BE6557B airfoil.

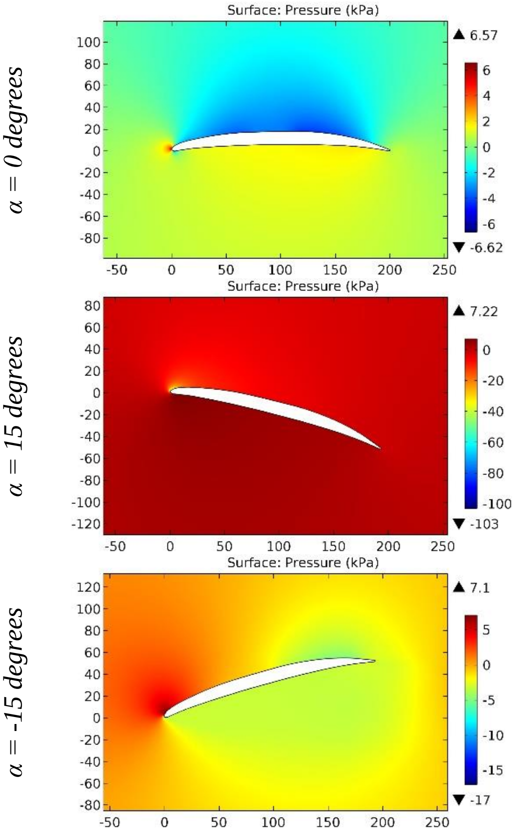


Figure 38. The pressure contours on the surfaces of the BE6606 airfoil.

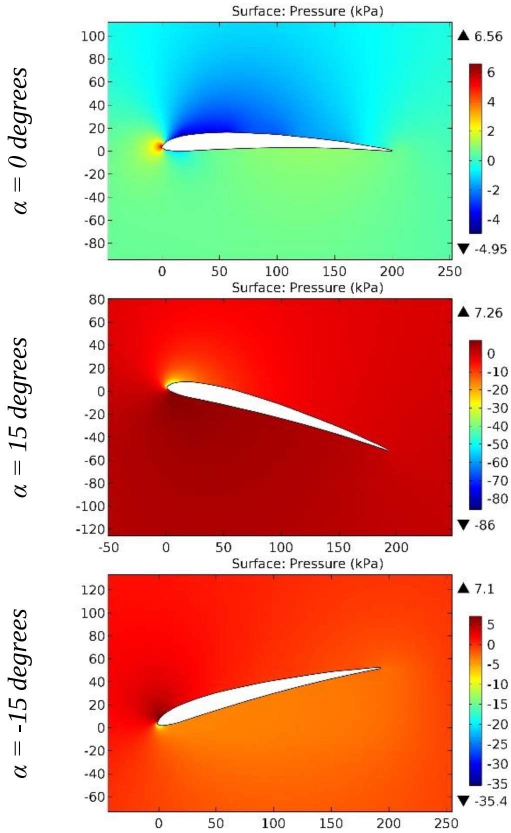


Figure 39. The pressure contours on the surfaces of the BE7404B airfoil.

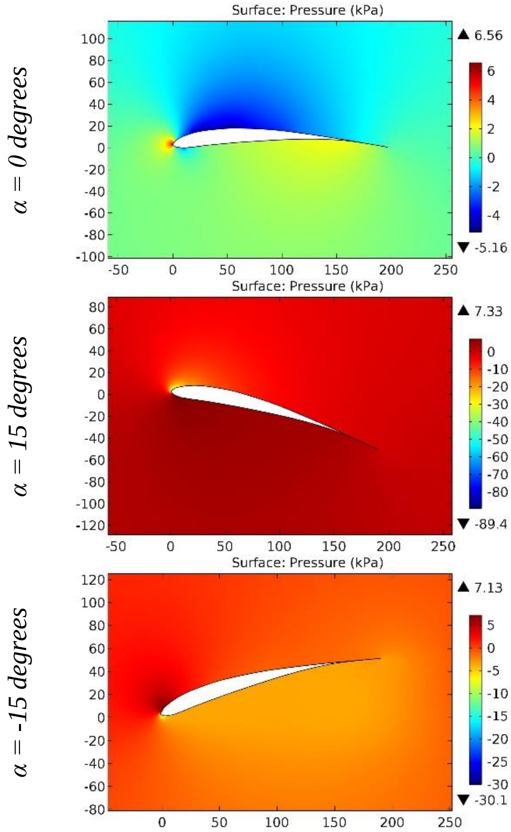


Figure 40. The pressure contours on the surfaces of the BE7455E airfoil.

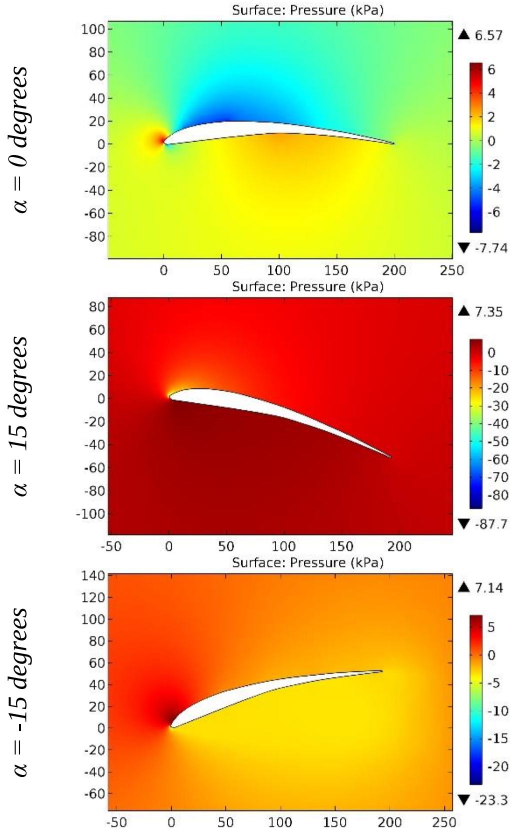


Figure 41. The pressure contours on the surfaces of the BE7457D airfoil.

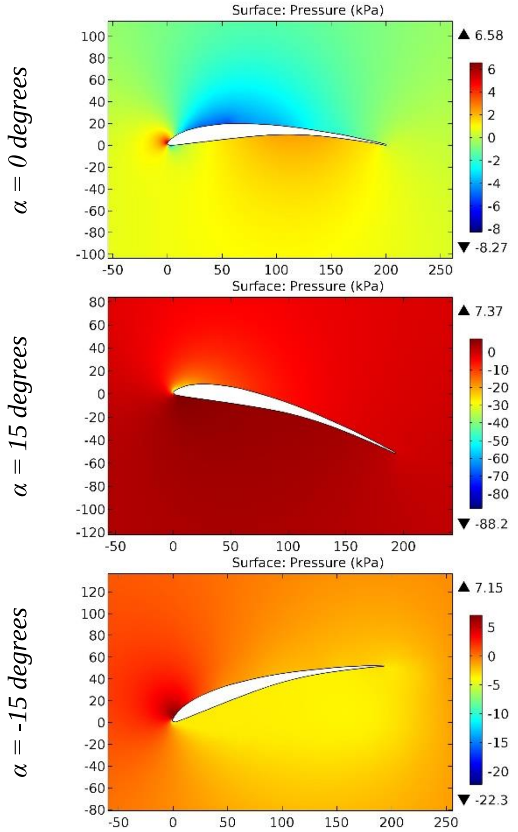


Figure 42. The pressure contours on the surfaces of the BE7457D2 airfoil.

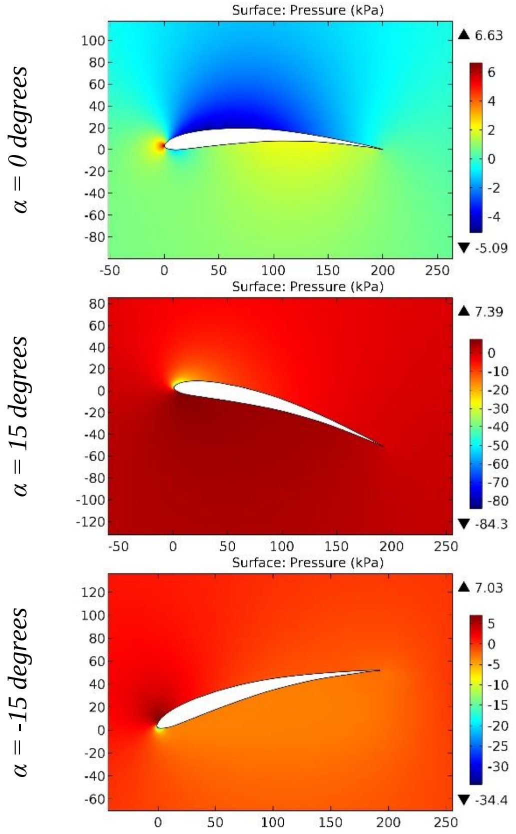


Figure 43. The pressure contours on the surfaces of the BE7505D airfoil.

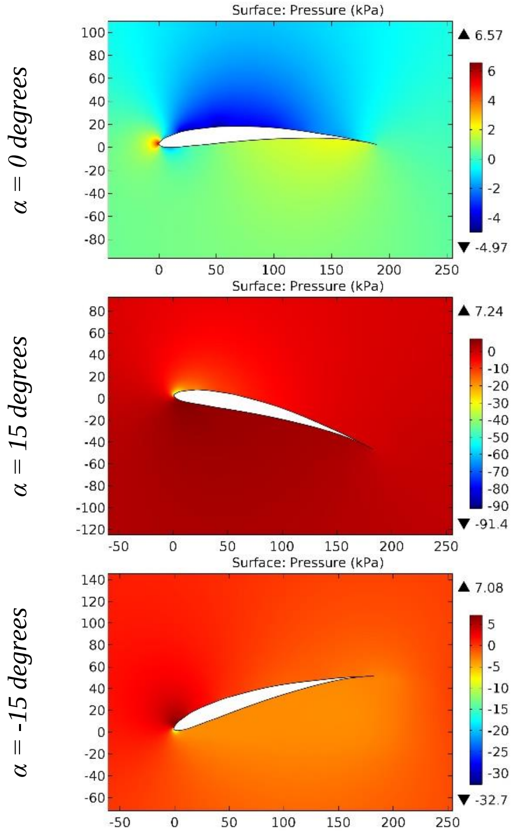


Figure 44. The pressure contours on the surfaces of the BE7505E airfoil.

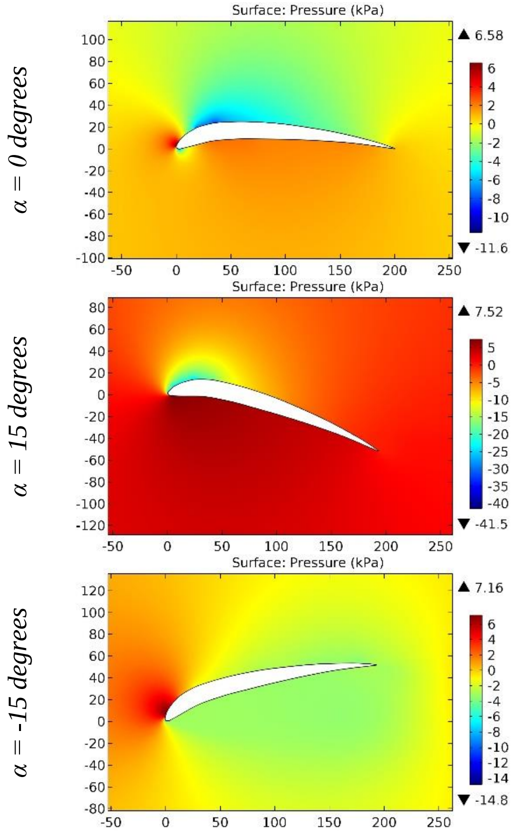


Figure 45. The pressure contours on the surfaces of the BE8258 airfoil.

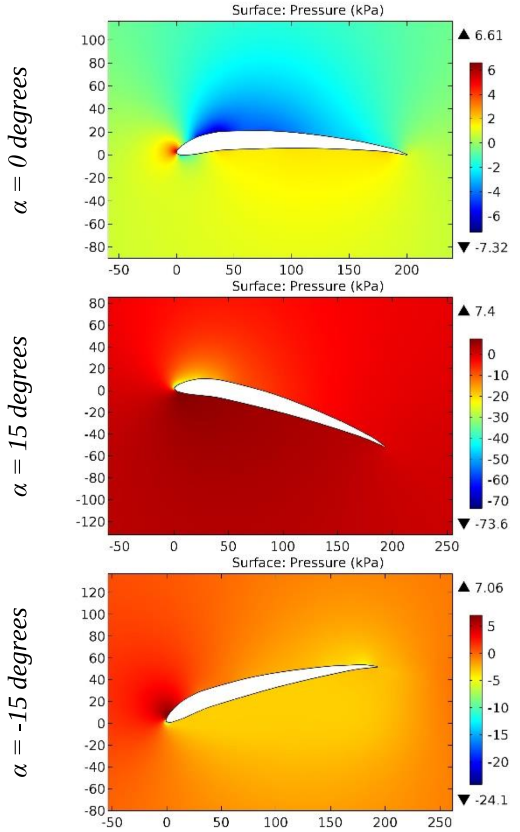


Figure 46. The pressure contours on the surfaces of the BE8306 airfoil.

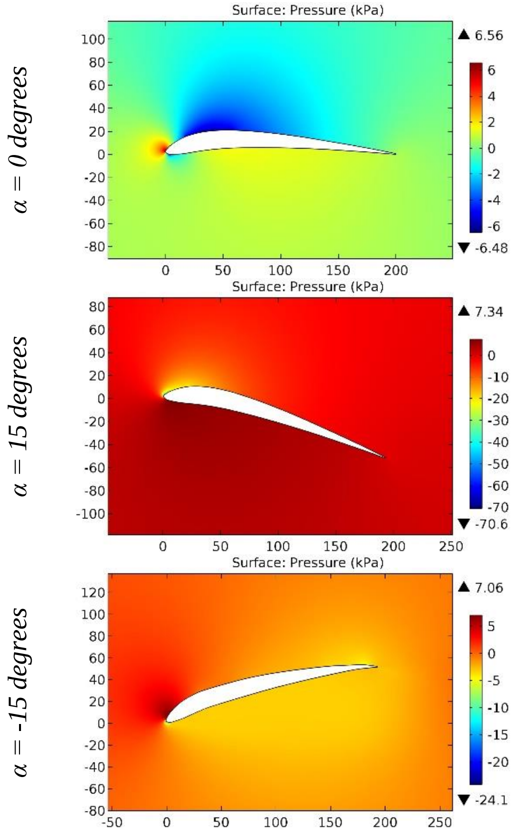


Figure 47. The pressure contours on the surfaces of the BE8306B airfoil.

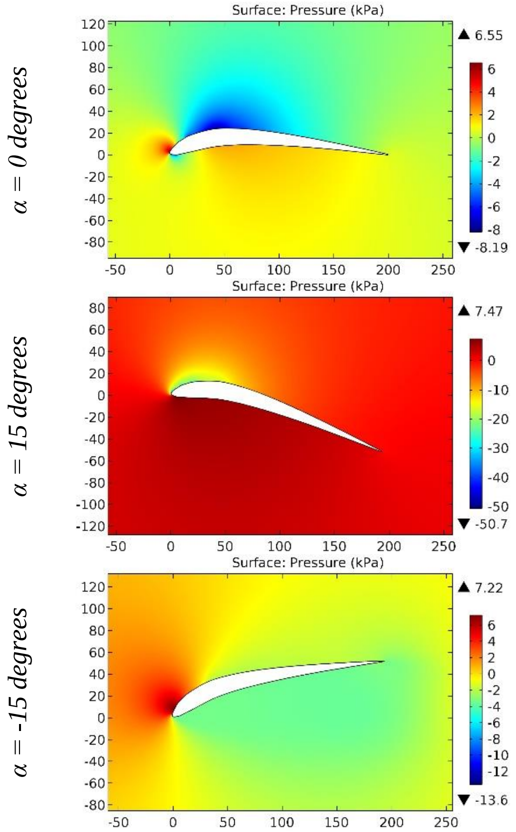


Figure 48. The pressure contours on the surfaces of the BE8308B airfoil.

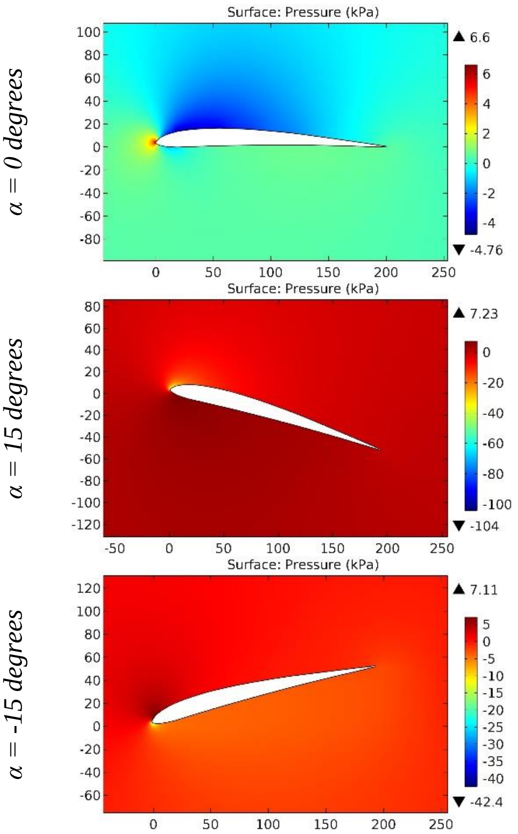


Figure 49. The pressure contours on the surfaces of the BE8353B airfoil.

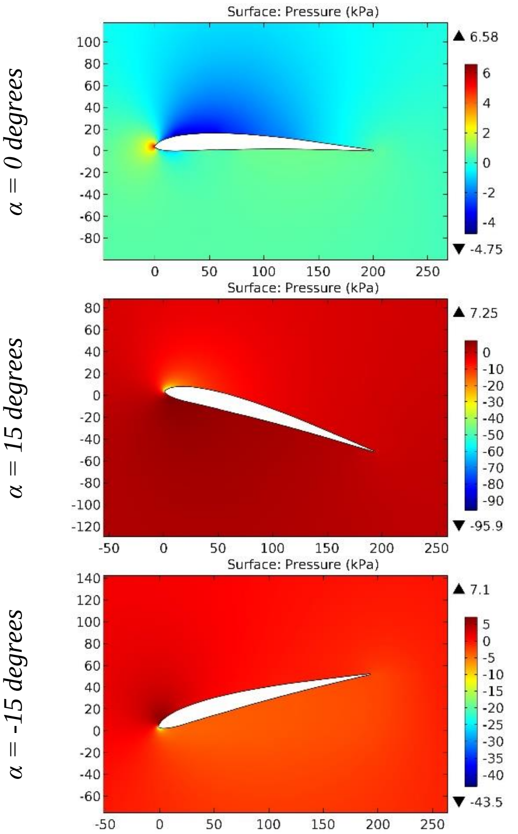


Figure 50. The pressure contours on the surfaces of the BE8353B2 airfoil.

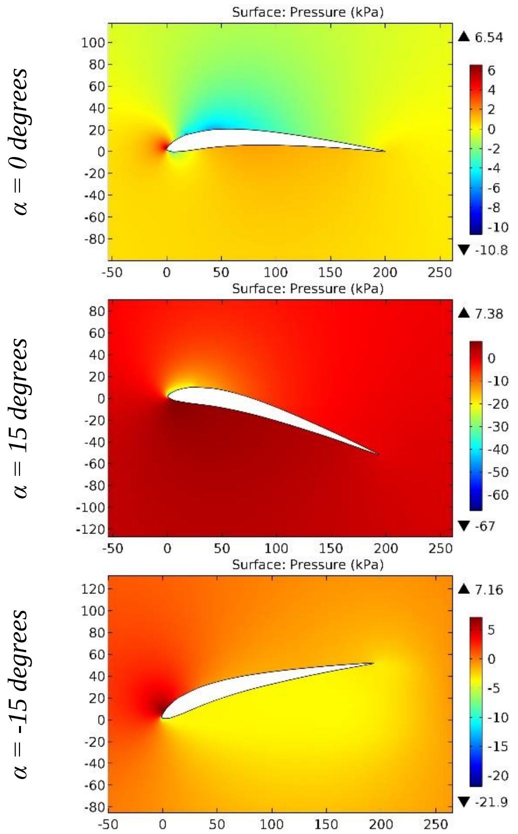


Figure 51. The pressure contours on the surfaces of the BE8356 airfoil.

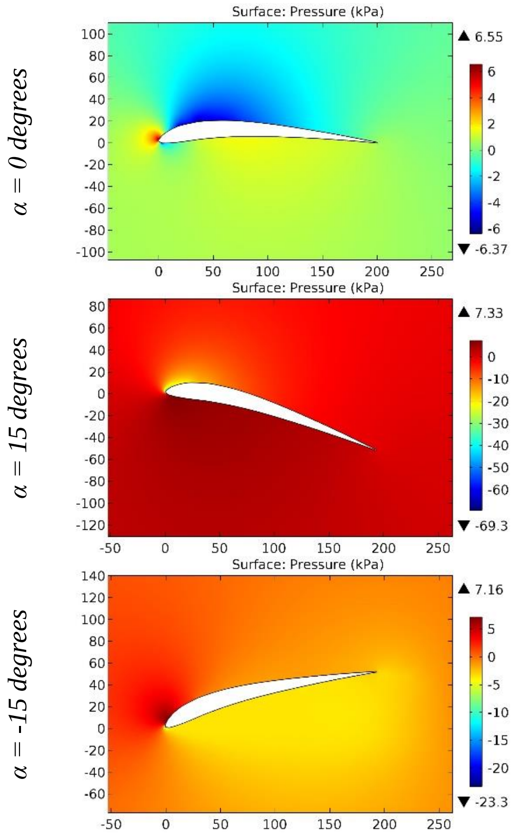


Figure 52. The pressure contours on the surfaces of the BE8356B airfoil.

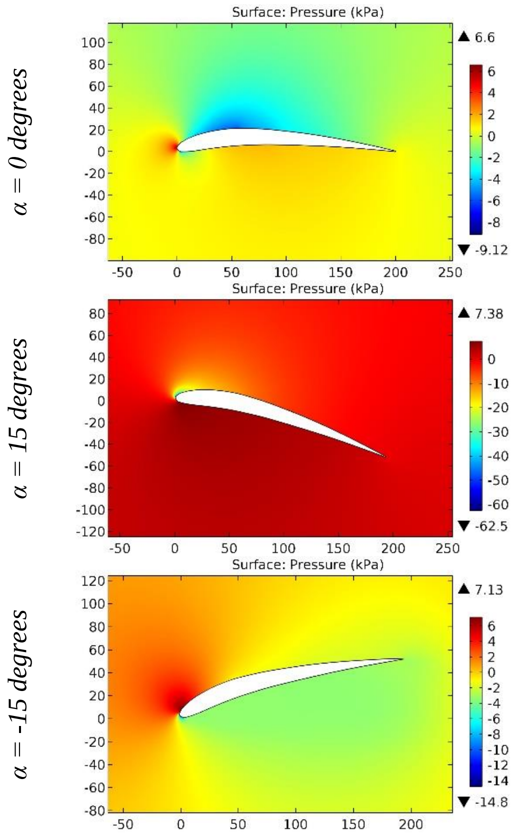


Figure 53. The pressure contours on the surfaces of the BE8356B2 airfoil.

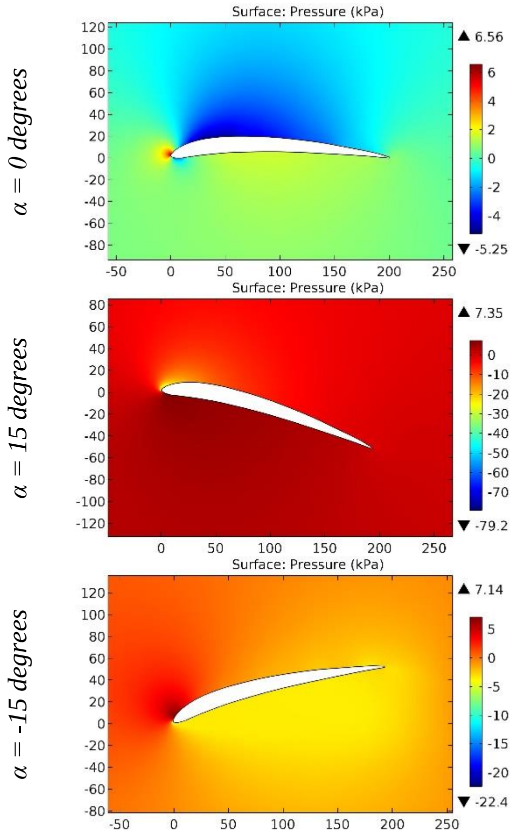


Figure 54. The pressure contours on the surfaces of the BE8356B3 airfoil.

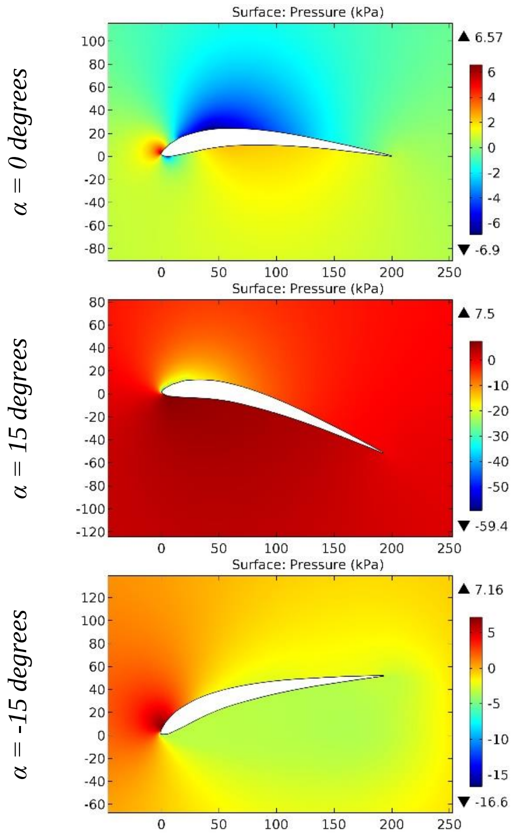


Figure 55. The pressure contours on the surfaces of the BE8358B airfoil.

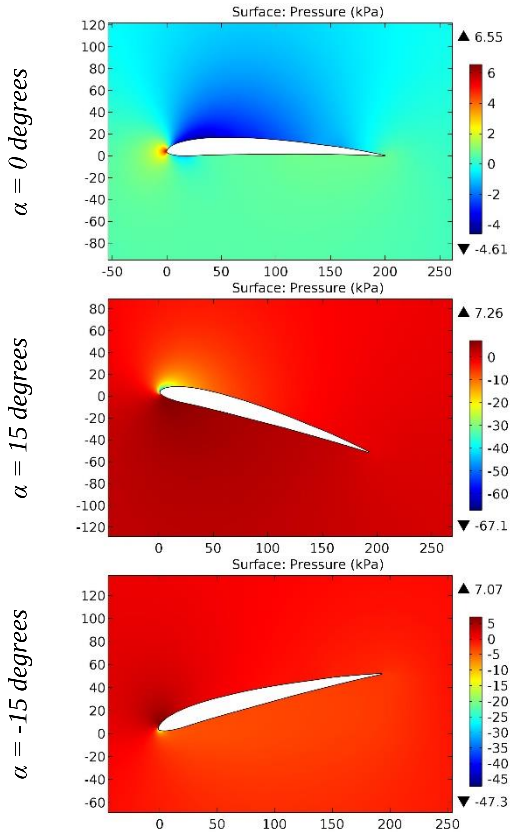


Figure 56. The pressure contours on the surfaces of the BE8403B airfoil.

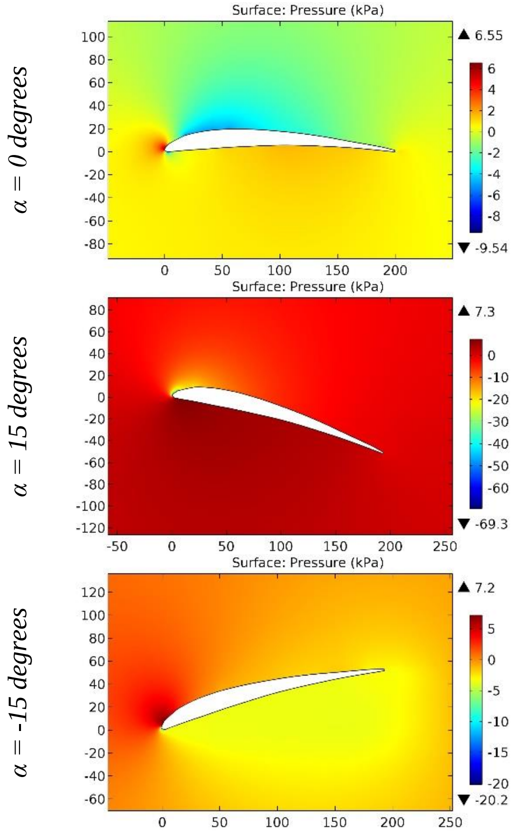


Figure 57. The pressure contours on the surfaces of the BE8405B airfoil.

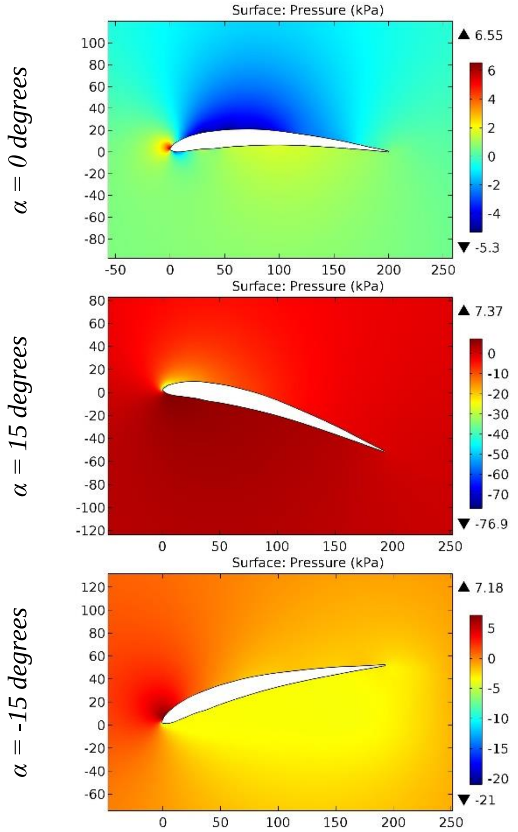


Figure 58. The pressure contours on the surfaces of the BE8406C airfoil.

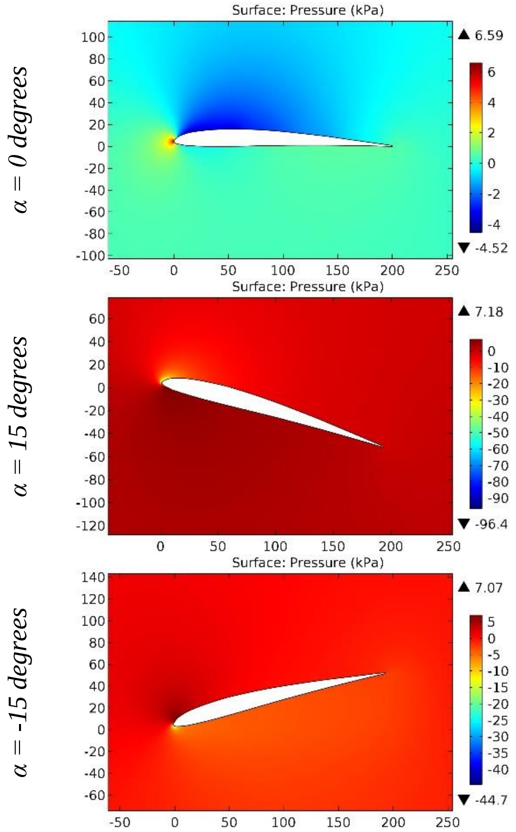


Figure 59. The pressure contours on the surfaces of the BE8452B airfoil.

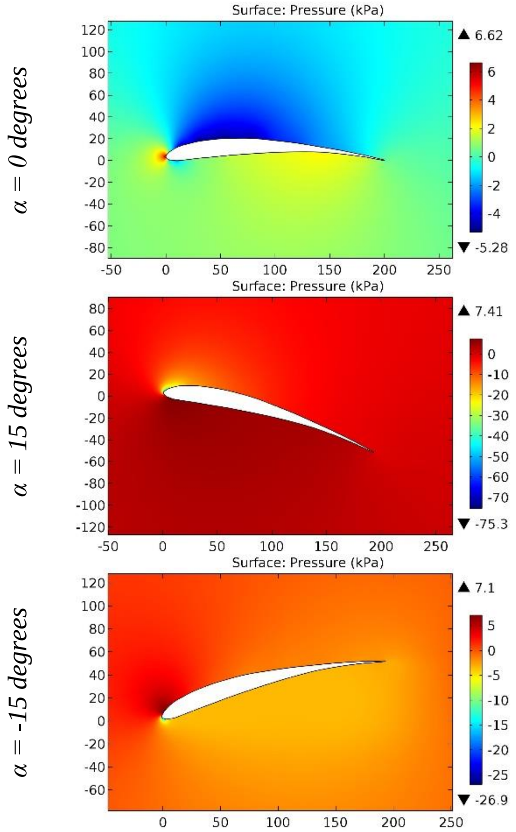


Figure 60. The pressure contours on the surfaces of the BE8456D airfoil.

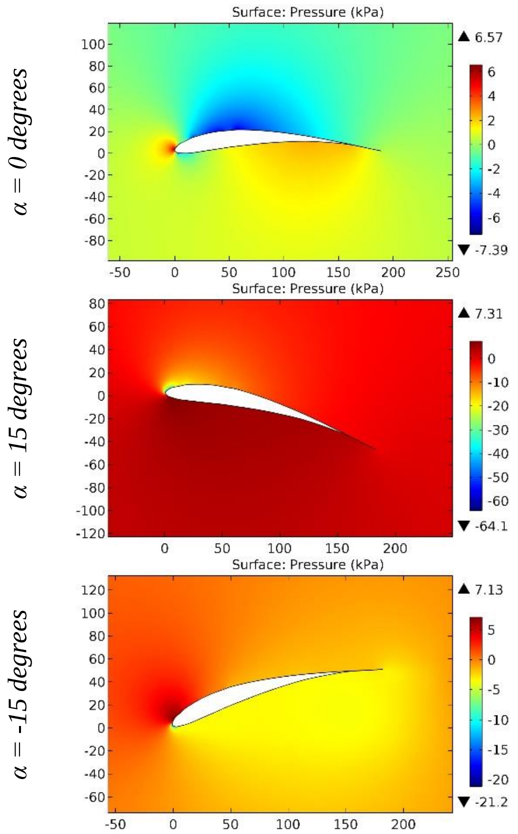


Figure 61. The pressure contours on the surfaces of the BE8457E airfoil.

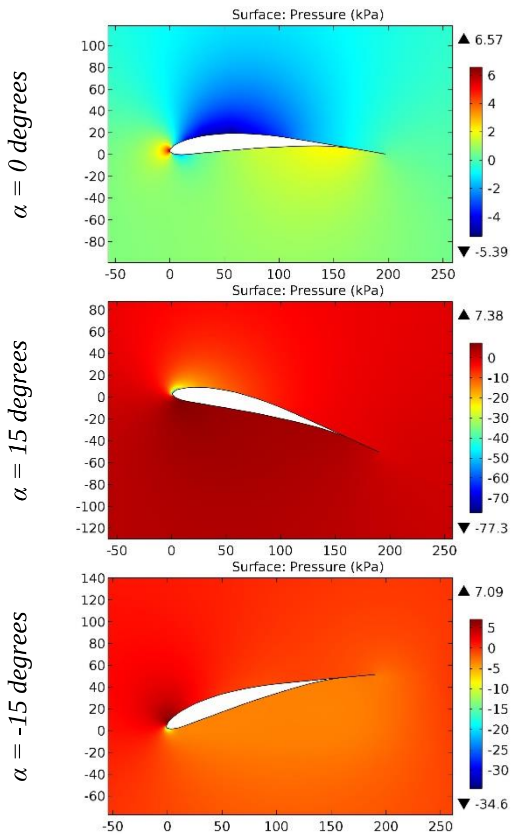


Figure 62. The pressure contours on the surfaces of the BE8505E airfoil.

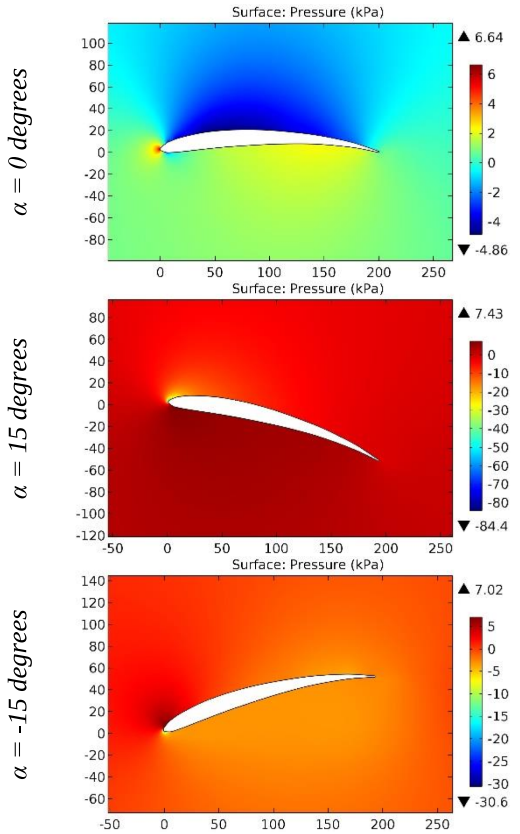


Figure 63. The pressure contours on the surfaces of the BE8556B airfoil.

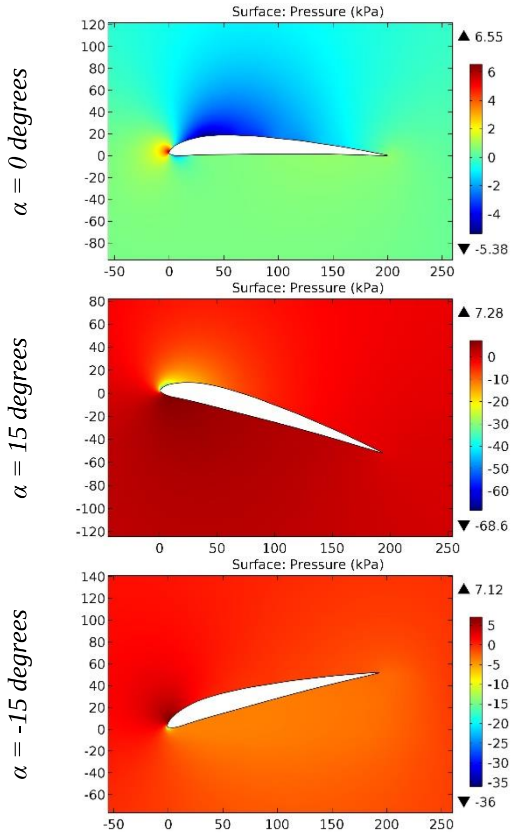


Figure 64. The pressure contours on the surfaces of the BE9304B airfoil.

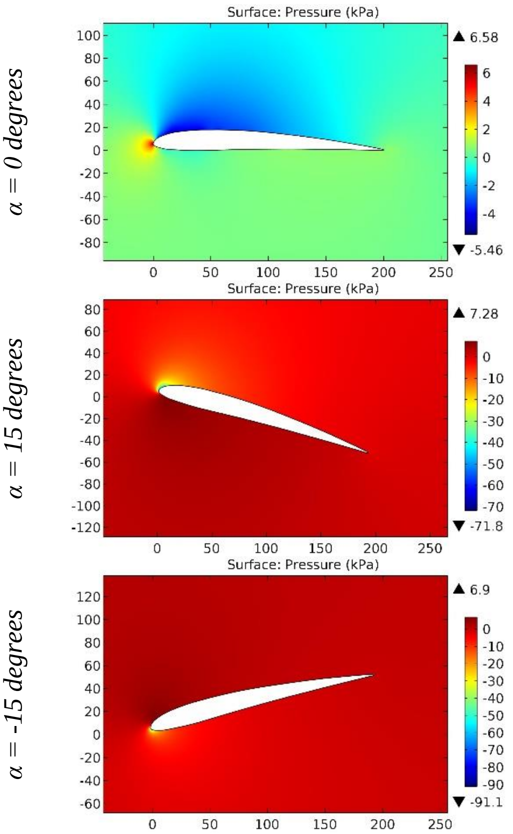


Figure 65. The pressure contours on the surfaces of the BE9403B airfoil.

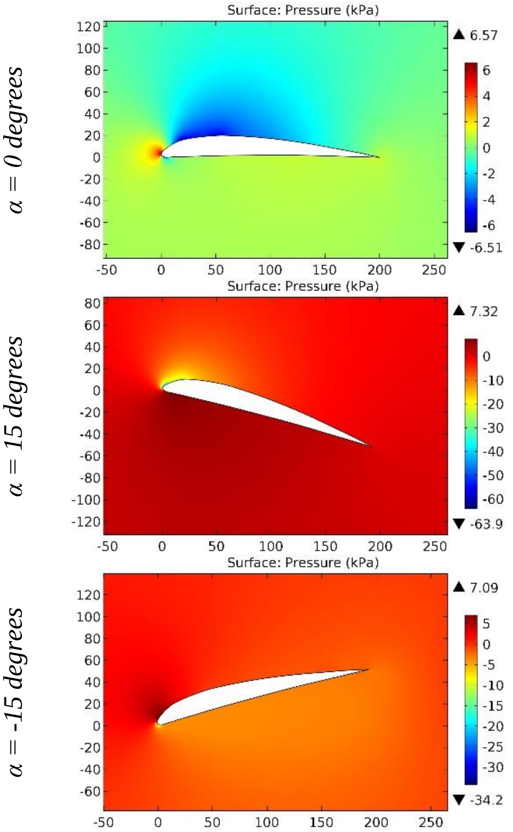


Figure 66. The pressure contours on the surfaces of the BE9404B airfoil.

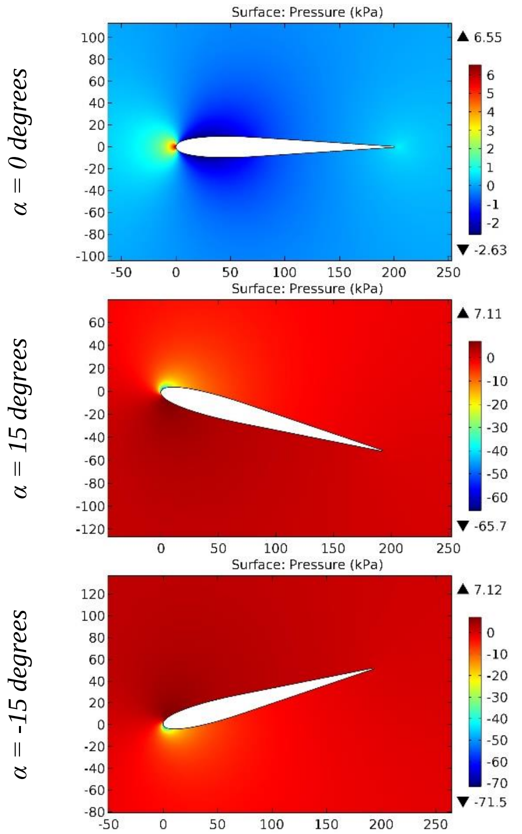


Figure 67. The pressure contours on the surfaces of the BELL 540 airfoil.

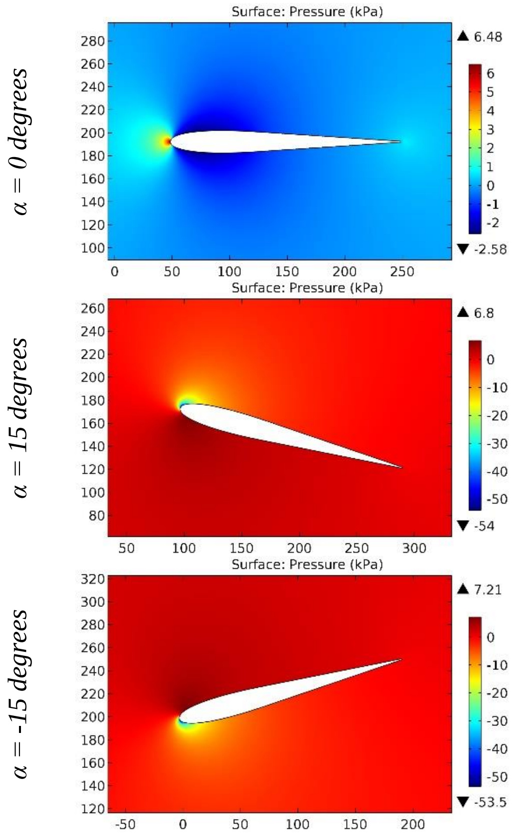


Figure 68. The pressure contours on the surfaces of the Bell AH-1 airfoil.

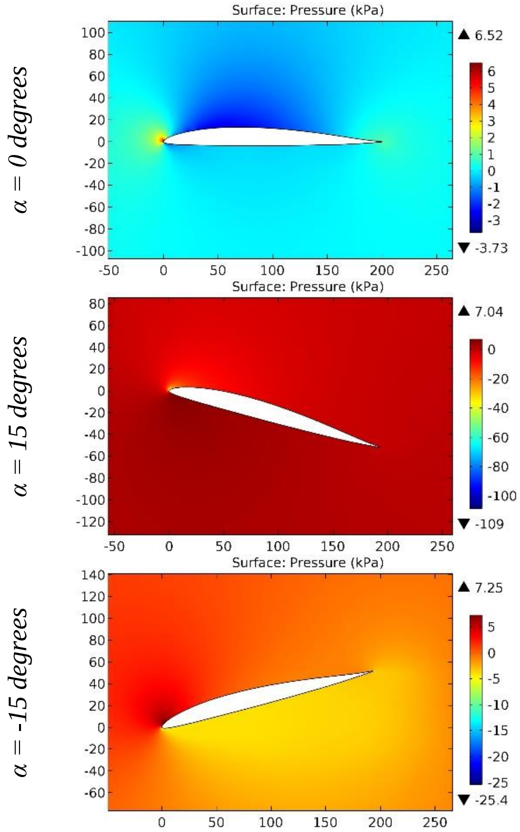


Figure 69. The pressure contours on the surfaces of the BELL-WORTMANN FX 69-H-083 airfoil.

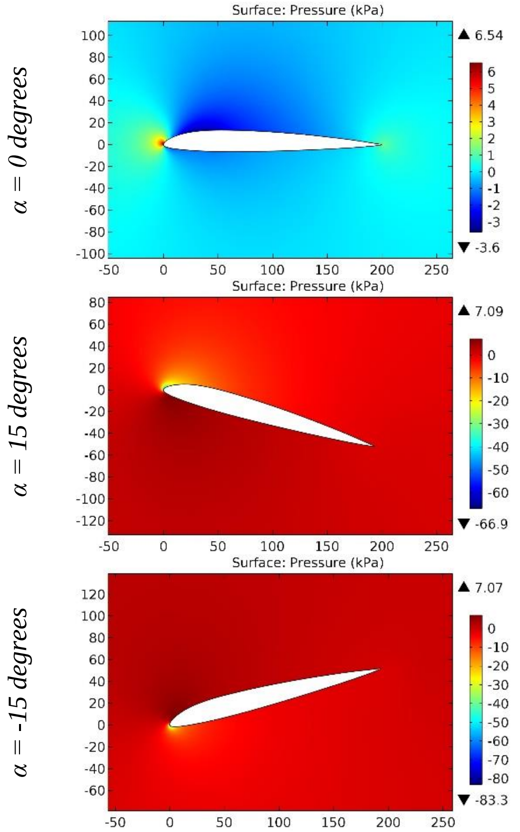


Figure 70. The pressure contours on the surfaces of the BELL-WORTMANN FX 69-H-098 airfoil.

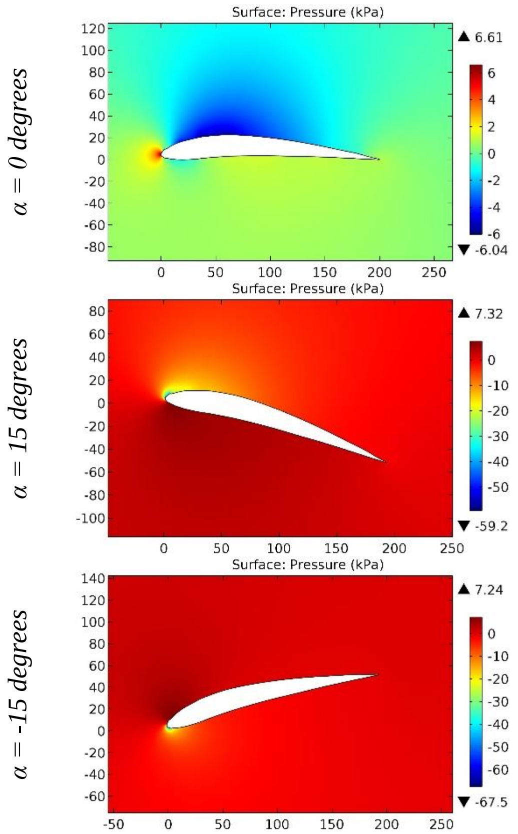


Figure 71. The pressure contours on the surfaces of the Benedek 10355 B airfoil.

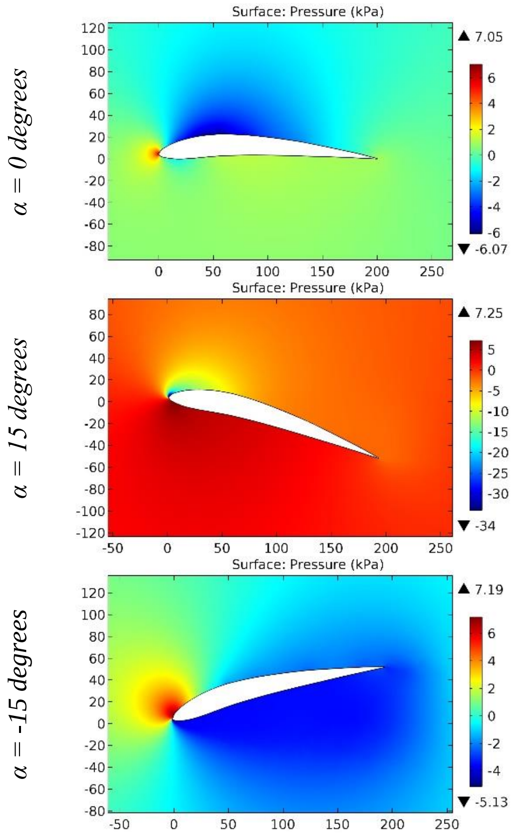


Figure 72. The pressure contours on the surfaces of the Benedek 1053 B airfoil.

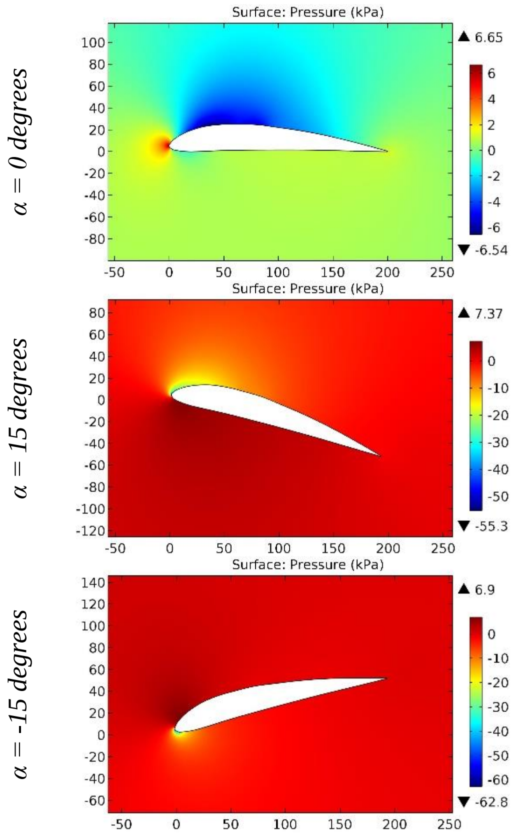


Figure 73. The pressure contours on the surfaces of the Benedek 12355 B airfoil.

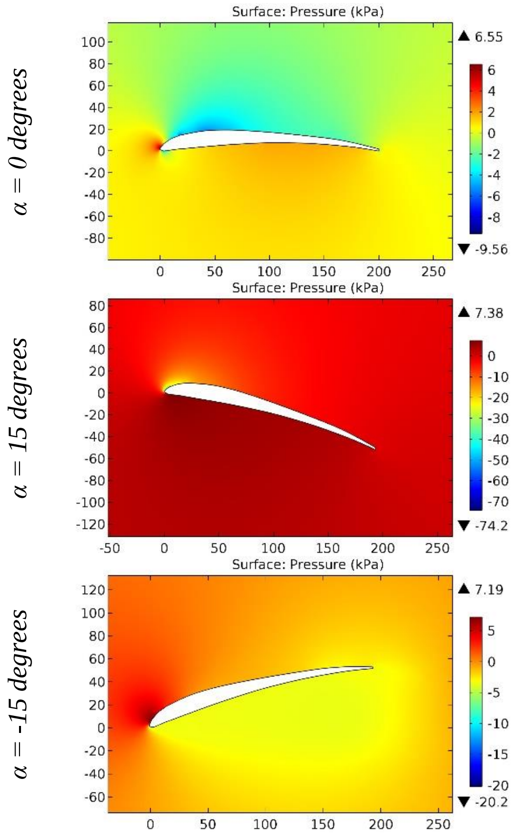


Figure 74. The pressure contours on the surfaces of the Benedek 7406 F airfoil.

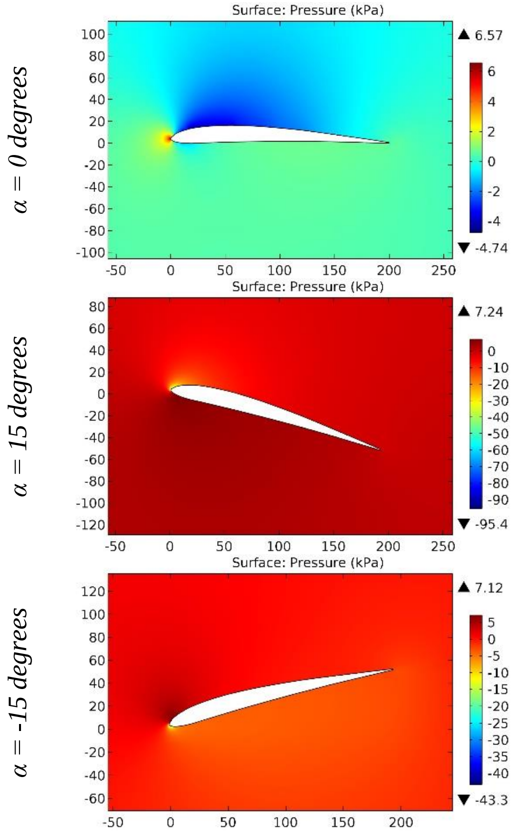


Figure 75. The pressure contours on the surfaces of the Benedek 8353 B-2 airfoil.

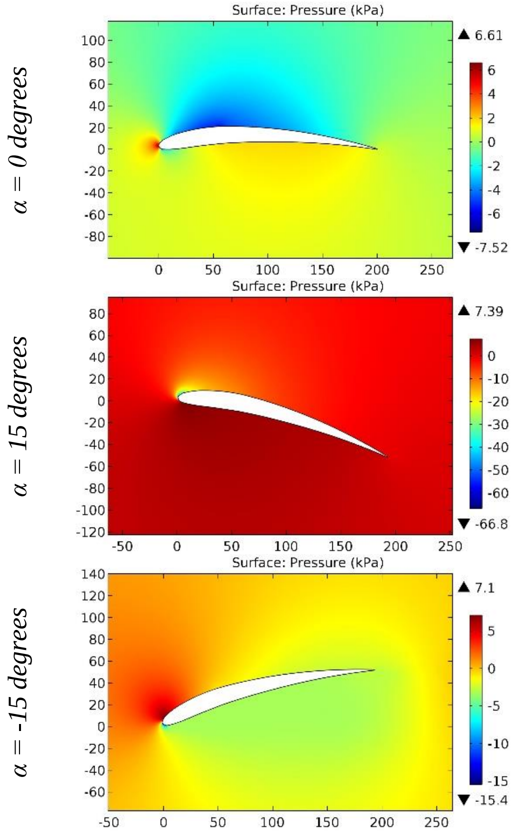


Figure 76. The pressure contours on the surfaces of the Benedek 8405 A airfoil.

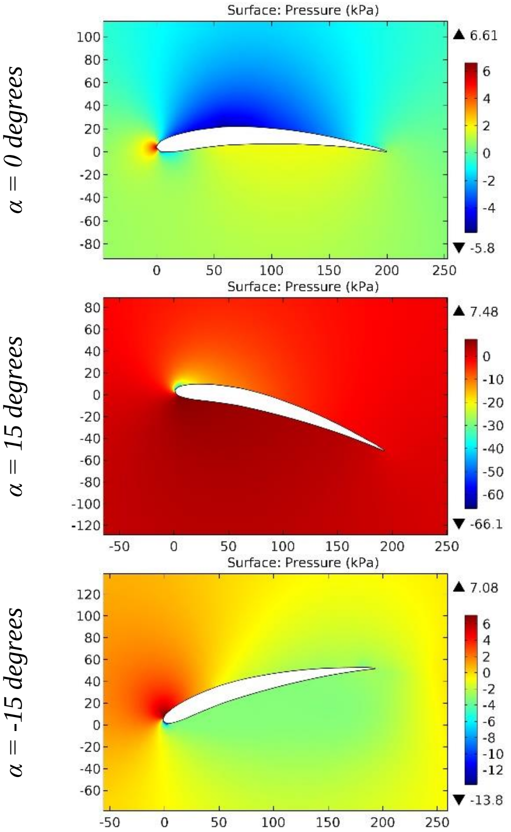


Figure 77. The pressure contours on the surfaces of the Benedek 8406 B airfoil.

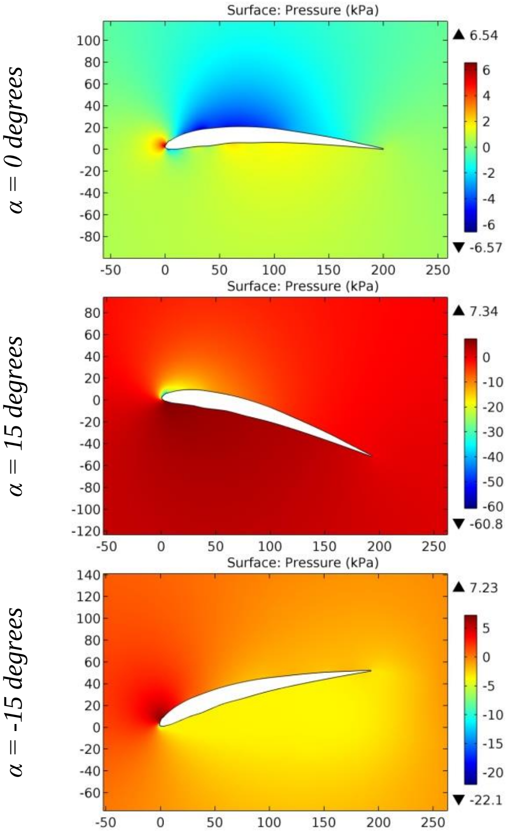


Figure 78. The pressure contours on the surfaces of the Benedek 8406 C airfoil.

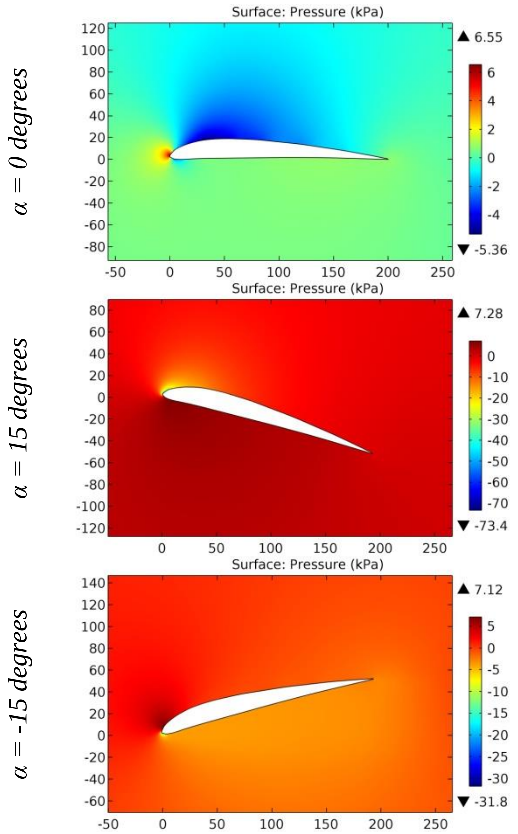


Figure 79. The pressure contours on the surfaces of the Benedek 9304 B airfoil.

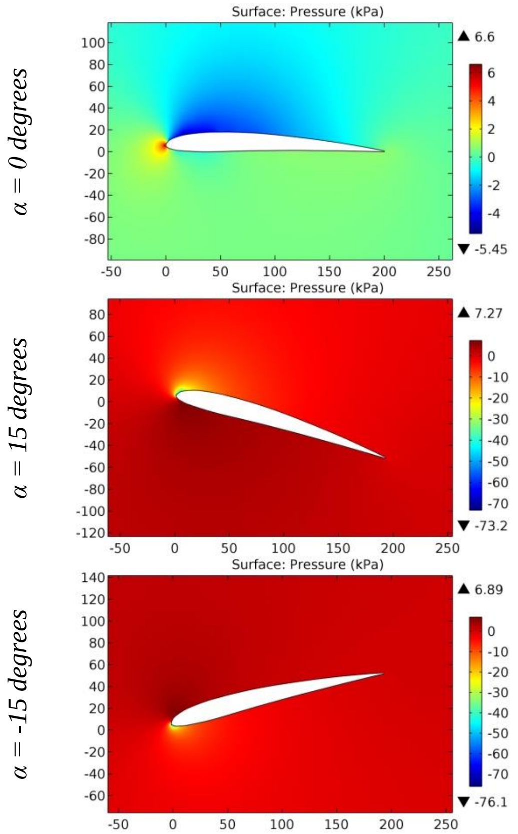


Figure 80. The pressure contours on the surfaces of the Benedek 9403 B airfoil.

Impact Factor:					
ISRA (India)	= **6.317**	**SIS** (USA)	= **0.912**	**ICV** (Poland)	= **6.630**
ISI (Dubai, UAE)	= **1.582**	**РИНЦ** (Russia)	= **3.939**	**PIF** (India)	= **1.940**
GIF (Australia)	= **0.564**	**ESJI** (KZ)	= **9.035**	**IBI** (India)	= **4.260**
JIF	= **1.500**	**SJIF** (Morocco)	= **7.184**	**OAJI** (USA)	= **0.350**

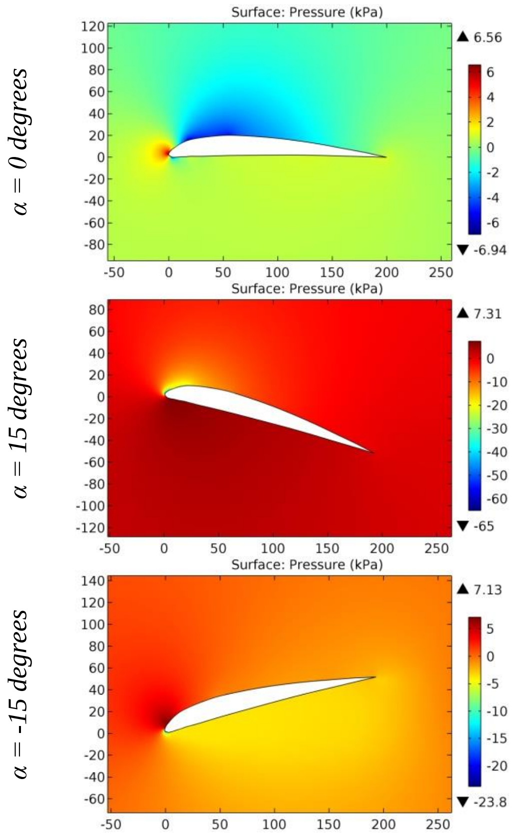


Figure 81. The pressure contours on the surfaces of the Benedek 9404 B airfoil.

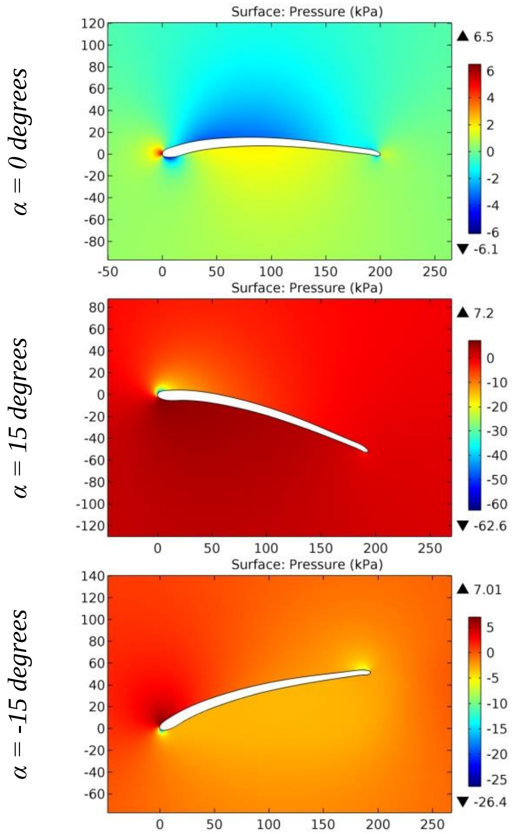


Figure 82. The pressure contours on the surfaces of the Bergey BW-3 (smoothed) airfoil.

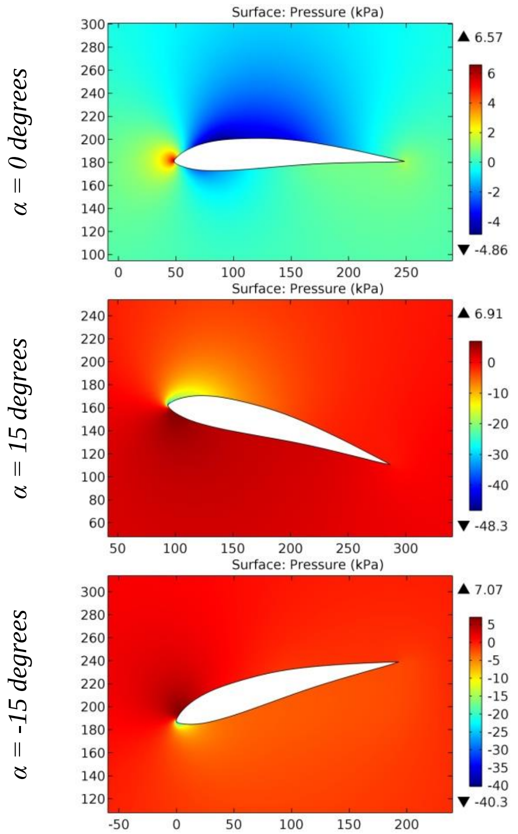


Figure 83. The pressure contours on the surfaces of the Blanchard WB135/35 airfoil.

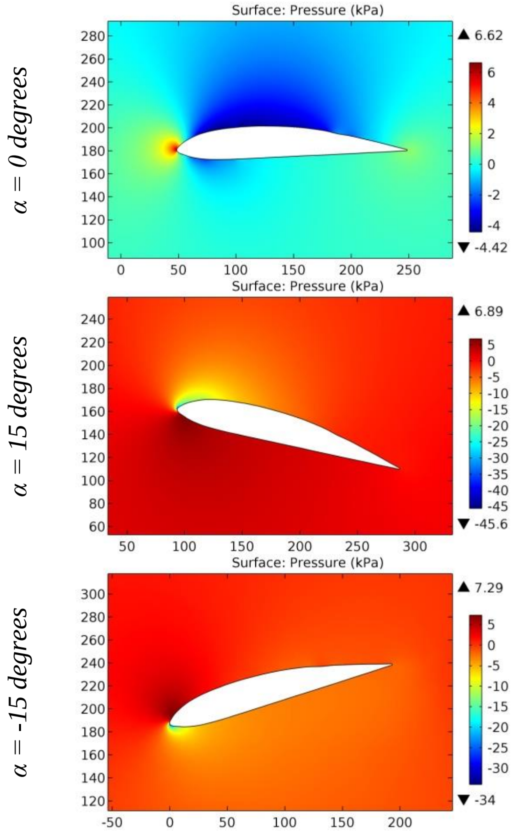


Figure 84. The pressure contours on the surfaces of the Blanchard WB140/35/FB airfoil.

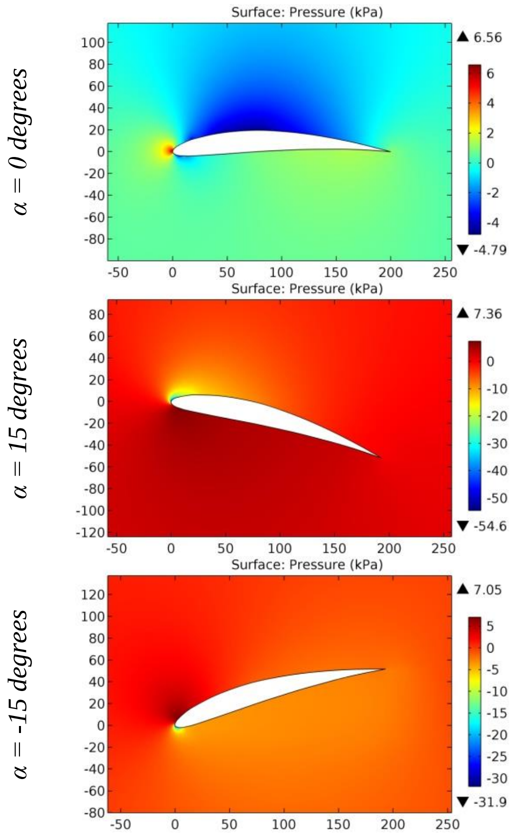


Figure 85. The pressure contours on the surfaces of the BO 545-310 airfoil.

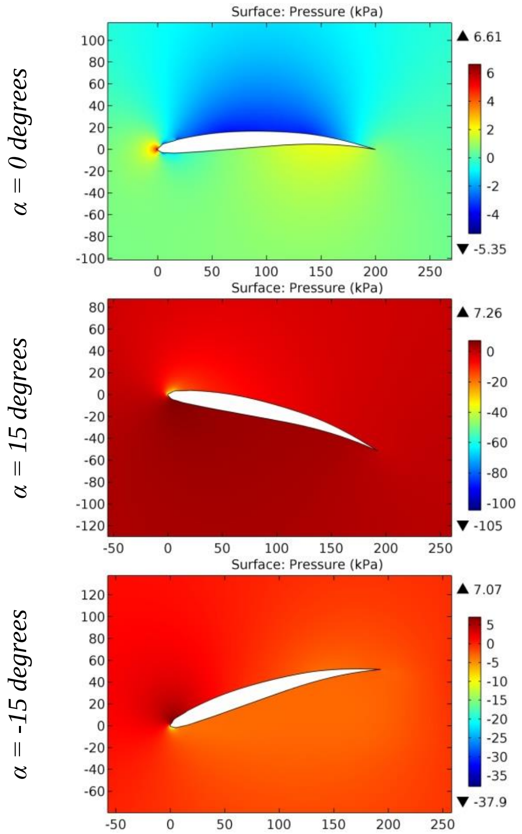


Figure 86. The pressure contours on the surfaces of the BO 560-38 airfoil.

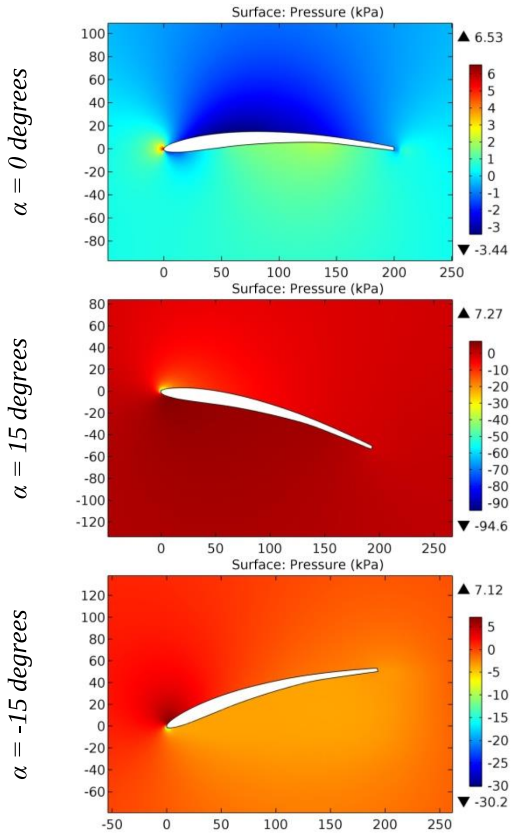


Figure 87. The pressure contours on the surfaces of the BOBWHITE airfoil.

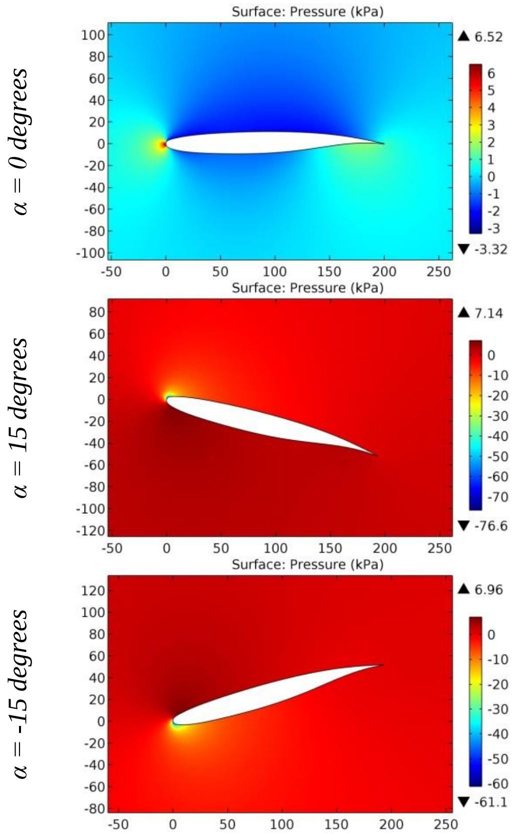


Figure 88. The pressure contours on the surfaces of the BOEING airfoil.

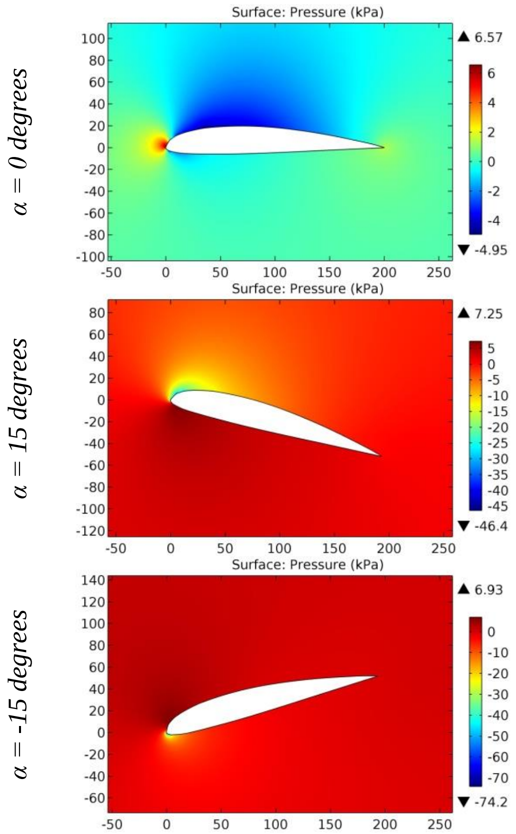


Figure 89. The pressure contours on the surfaces of the BOEING 103 airfoil.

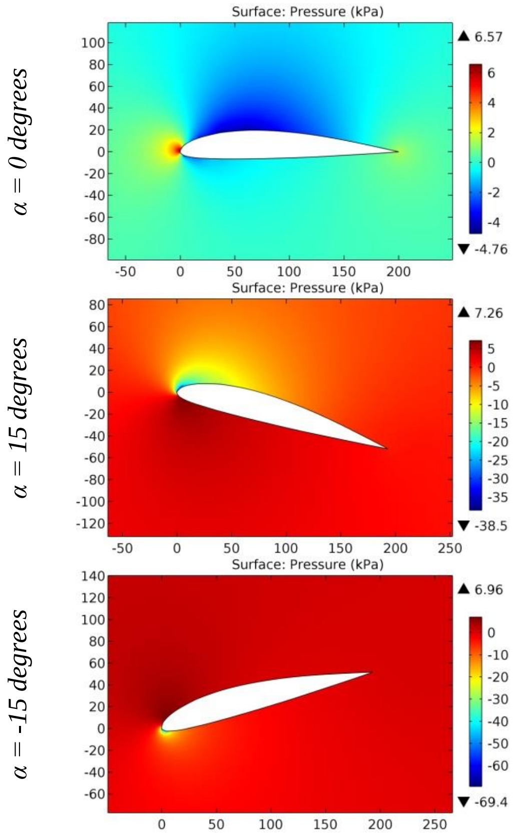


Figure 90. The pressure contours on the surfaces of the BOEING 106 airfoil.

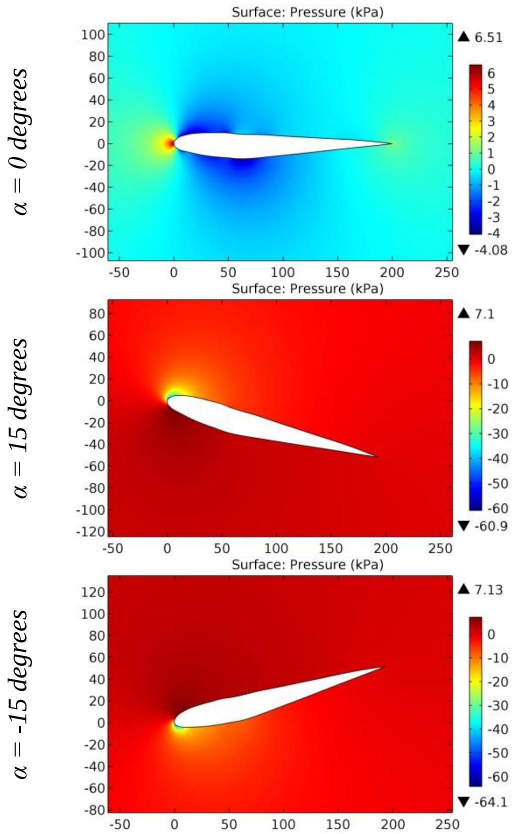


Figure 91. The pressure contours on the surfaces of the BOEING 707 ,08 SPAN airfoil.

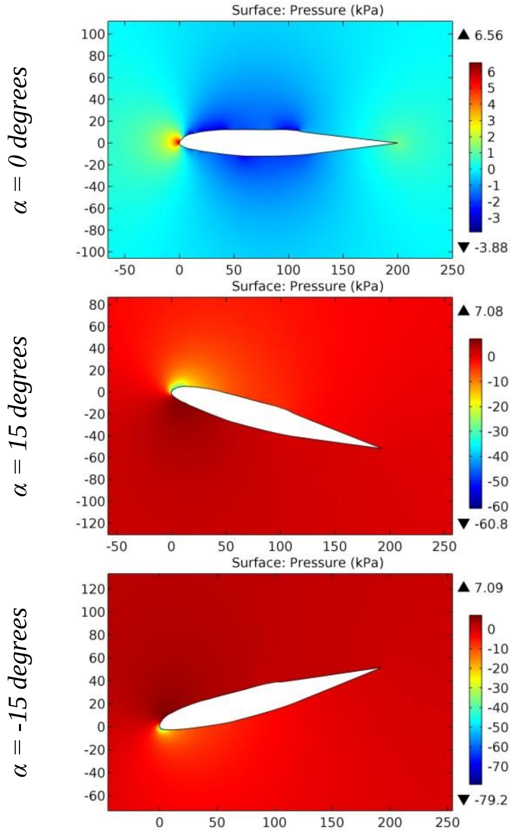


Figure 92. The pressure contours on the surfaces of the BOEING 707 ,19 SPAN airfoil.

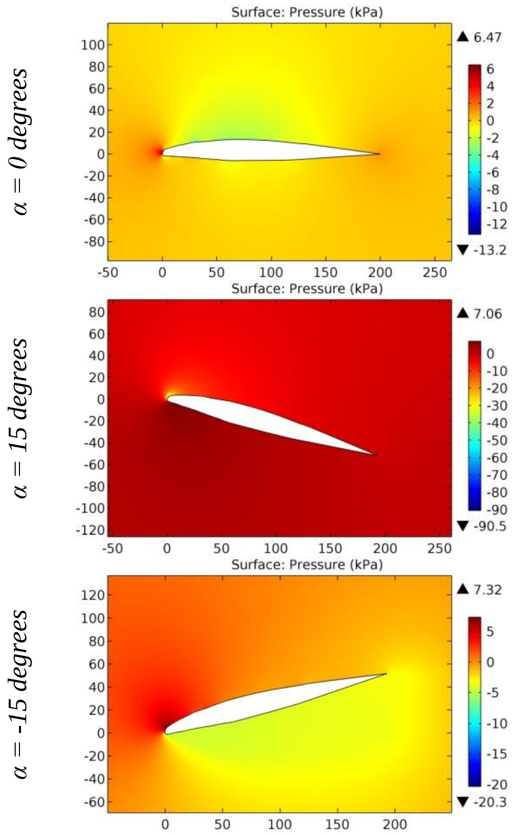


Figure 93. The pressure contours on the surfaces of the BOEING 707 ,40 SPAN airfoil.

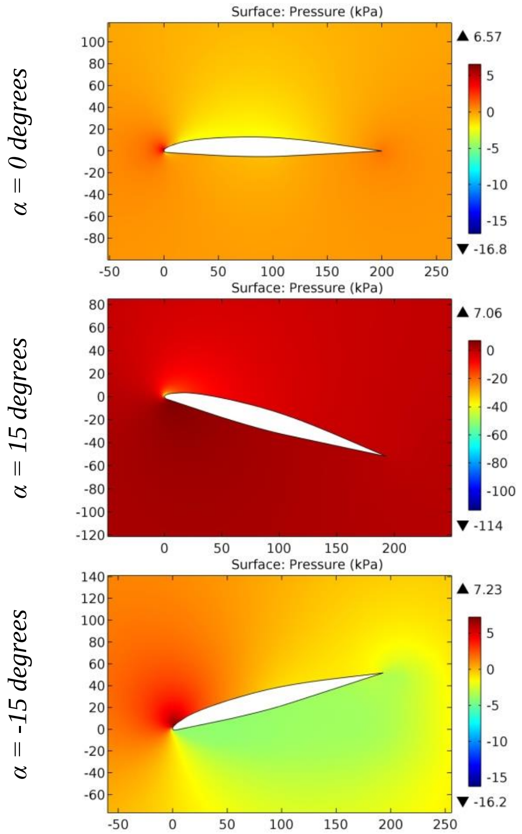


Figure 94. The pressure contours on the surfaces of the BOEING 707 ,54 SPAN airfoil.

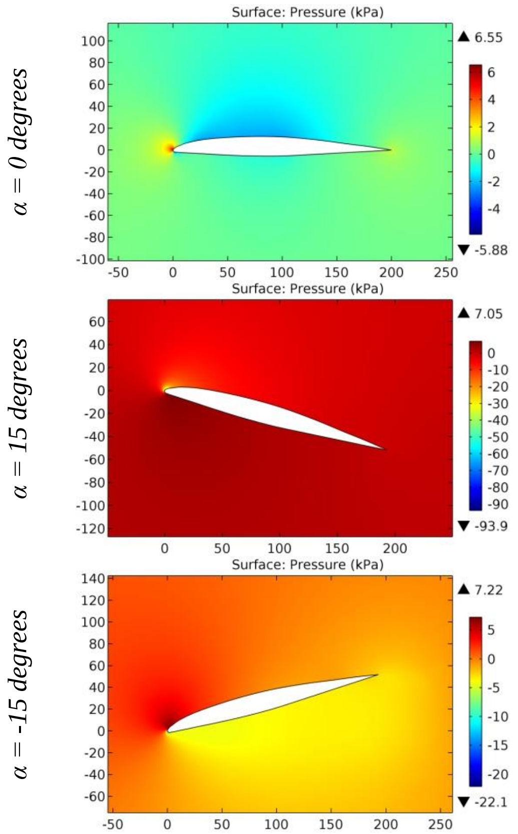


Figure 95. The pressure contours on the surfaces of the BOEING 707 ,99 SPAN airfoil.

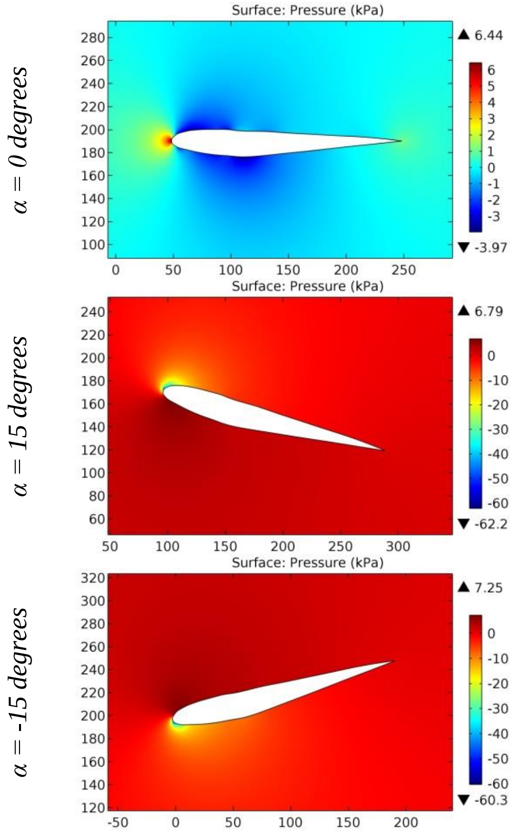


Figure 96. The pressure contours on the surfaces of the BOEING 707 .08 SPAN AIRFOIL.

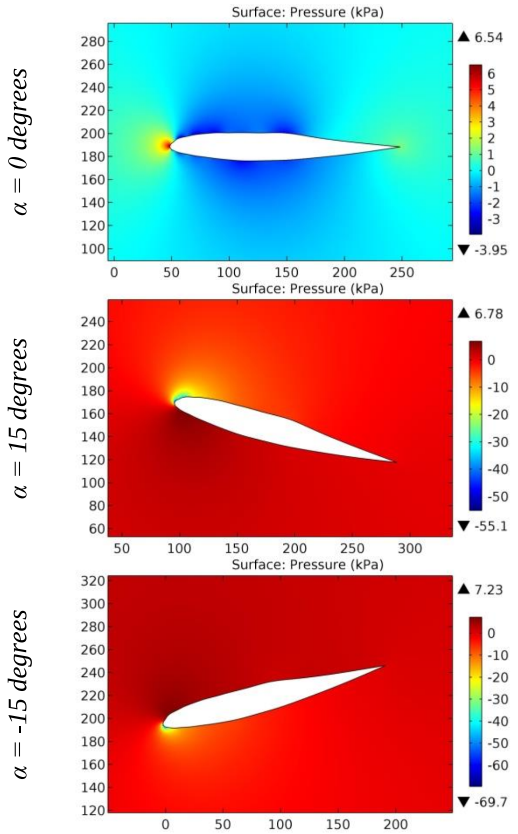


Figure 97. The pressure contours on the surfaces of the BOEING 707 .19 SPAN AIRFOIL.

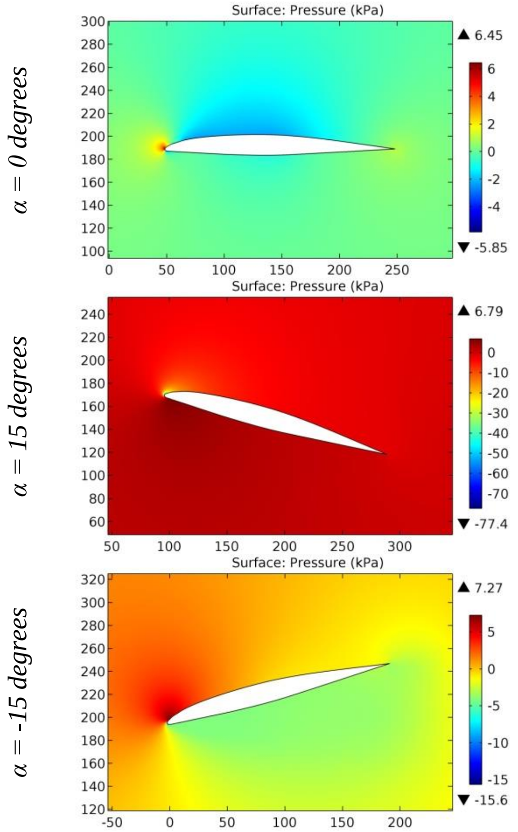


Figure 98. The pressure contours on the surfaces of the BOEING 707 .54 SPAN AIRFOIL.

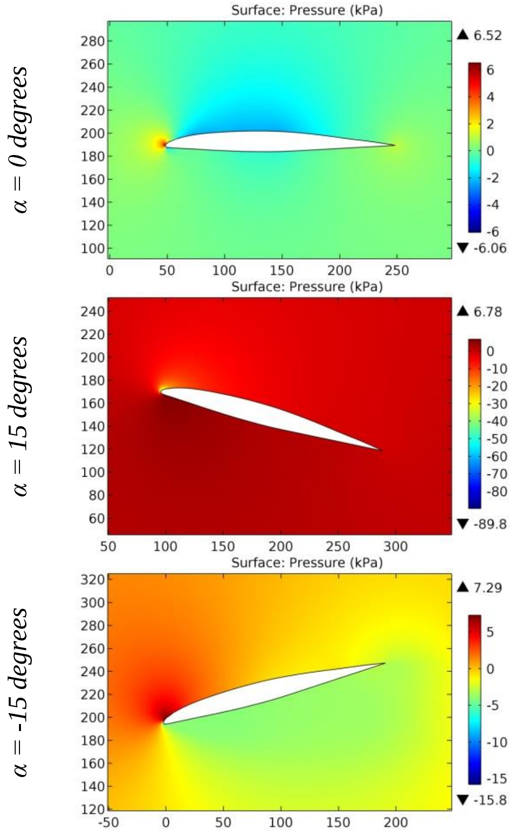


Figure 99. The pressure contours on the surfaces of the BOEING 707 .99 SPAN AIRFOIL.

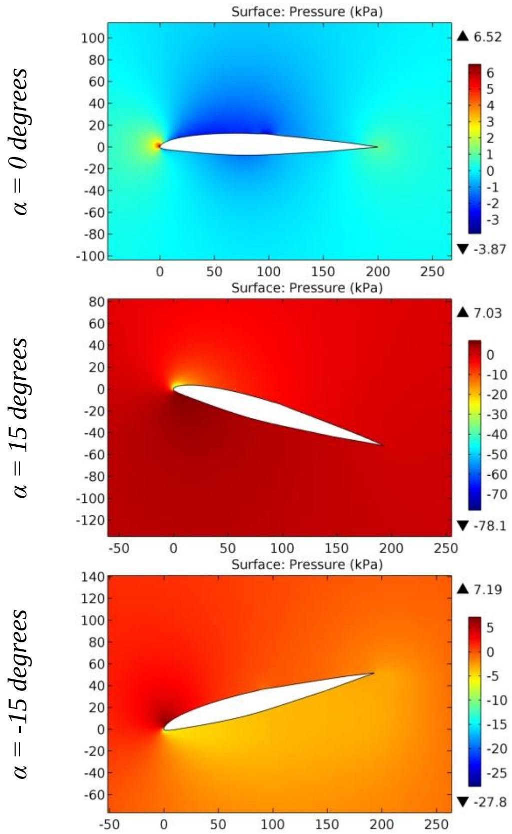


Figure 100. The pressure contours on the surfaces of the BOEING 737 MIDSPAN airfoil.

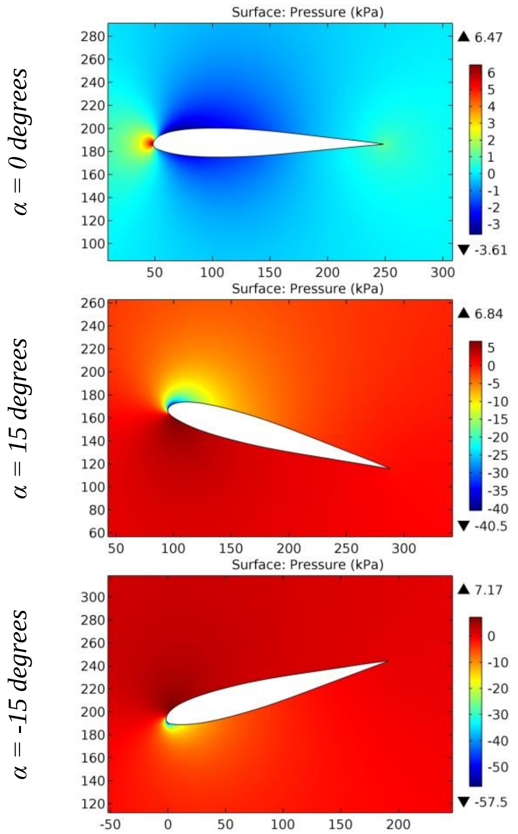


Figure 101. The pressure contours on the surfaces of the BOEING 737 MIDSPAN AIRFOIL.

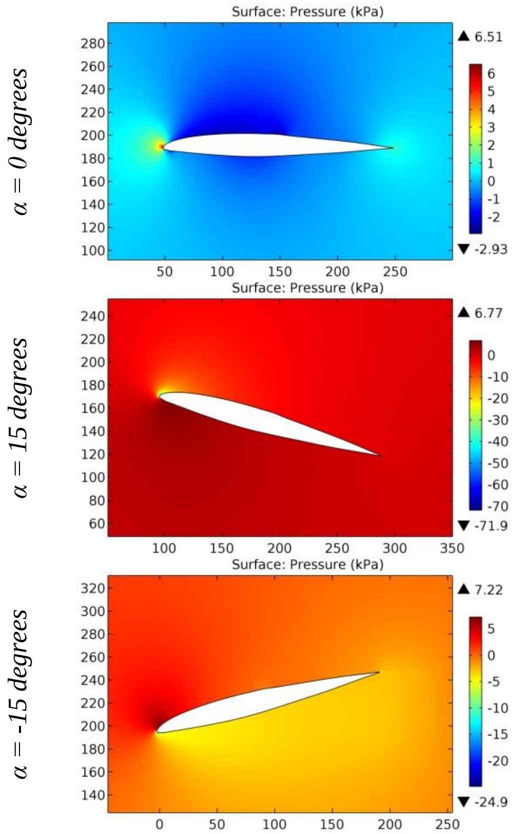


Figure 102. The pressure contours on the surfaces of the BOEING 737 MIDSPAN AIRFOIL-b.

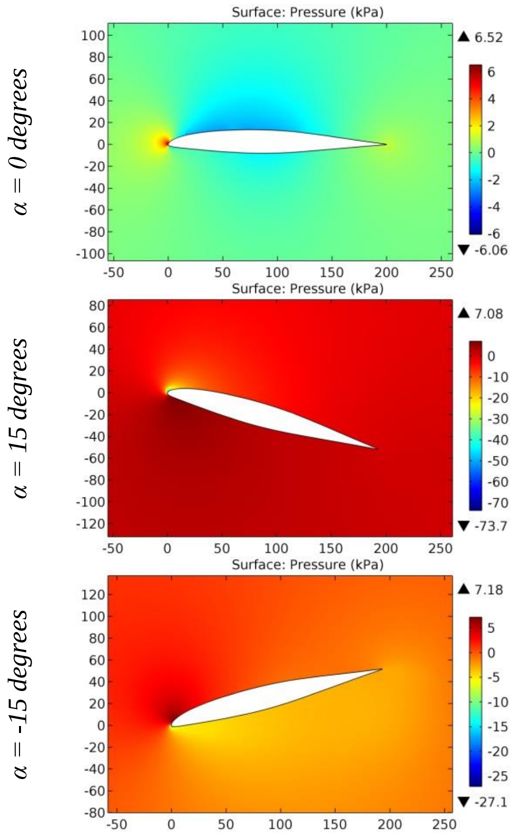


Figure 103. The pressure contours on the surfaces of the BOEING 737 OUTBOARD airfoil.

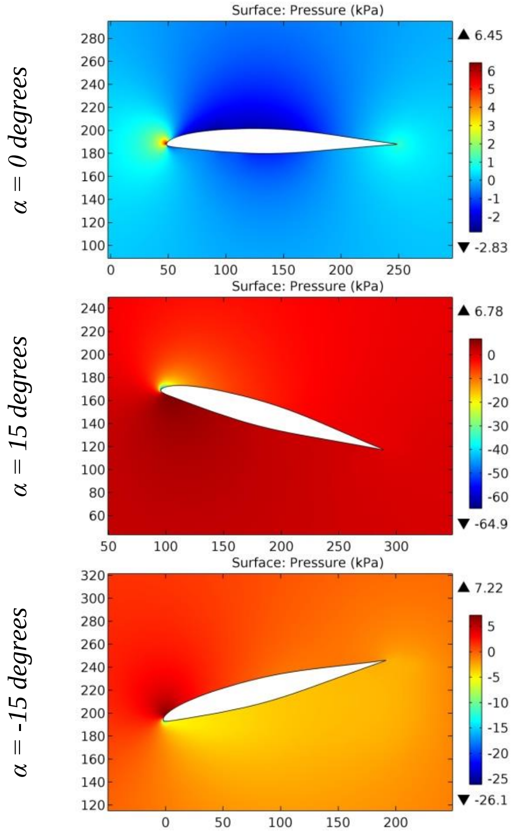


Figure 104. The pressure contours on the surfaces of the BOEING 737 OUTBOARD AIRFOIL.

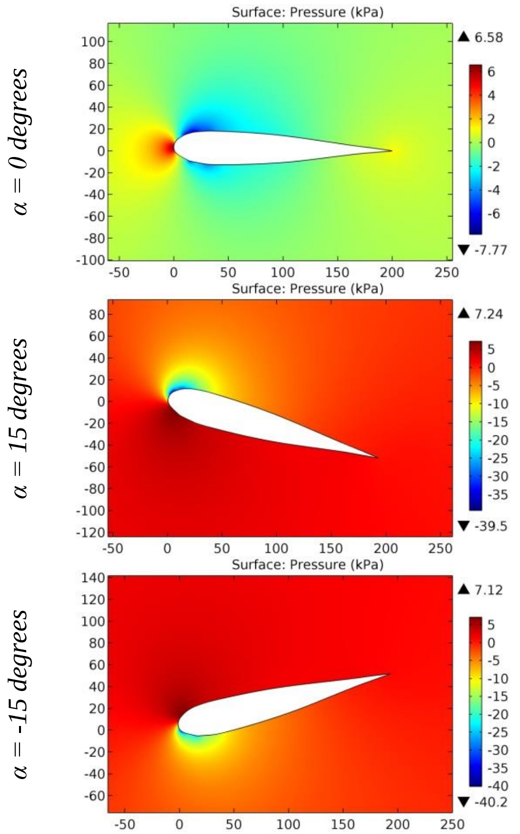


Figure 105. The pressure contours on the surfaces of the BOEING 737 ROOT airfoil.

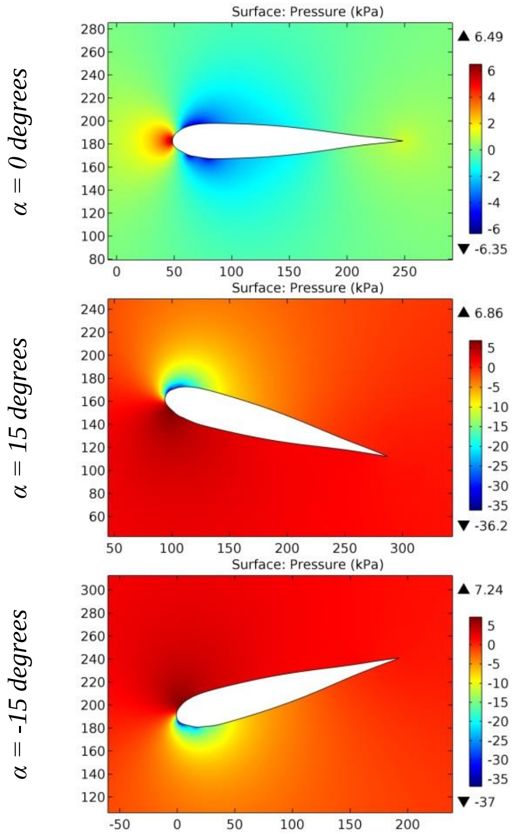


Figure 106. The pressure contours on the surfaces of the BOEING 737 ROOT AIRFOIL.

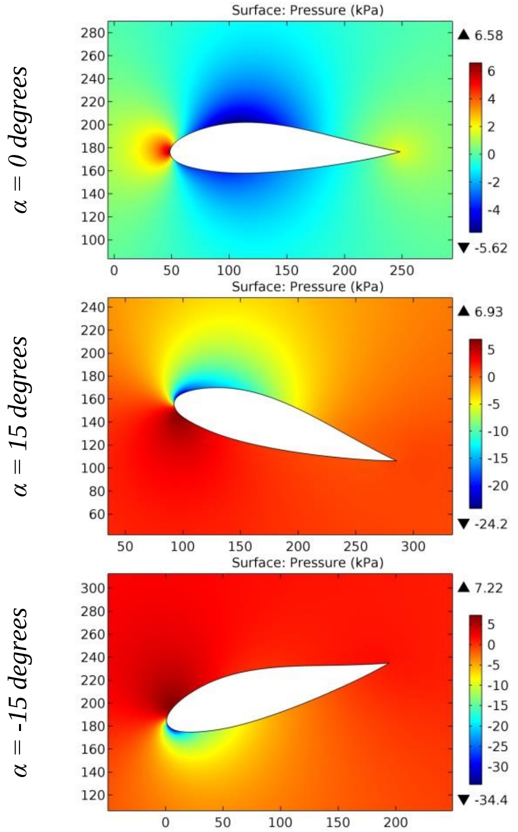


Figure 107. The pressure contours on the surfaces of the Boeing B-29 root airfoil.

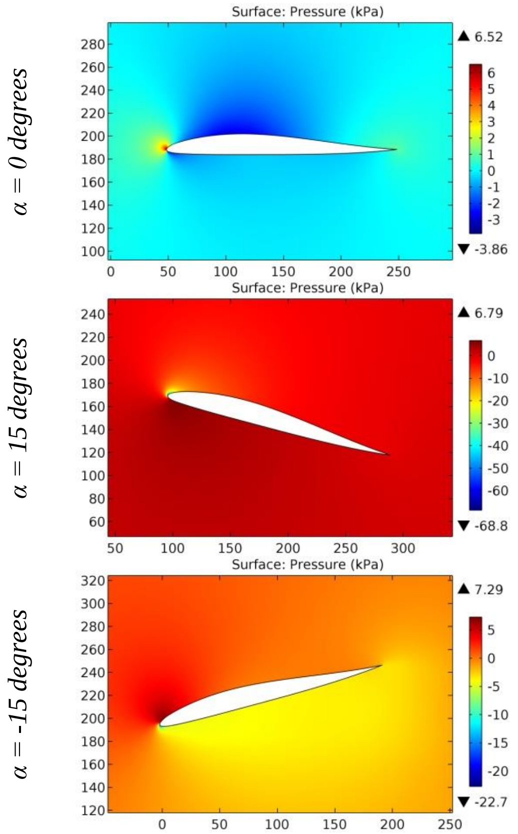


Figure 108. The pressure contours on the surfaces of the Boeing B-29 tip airfoil.

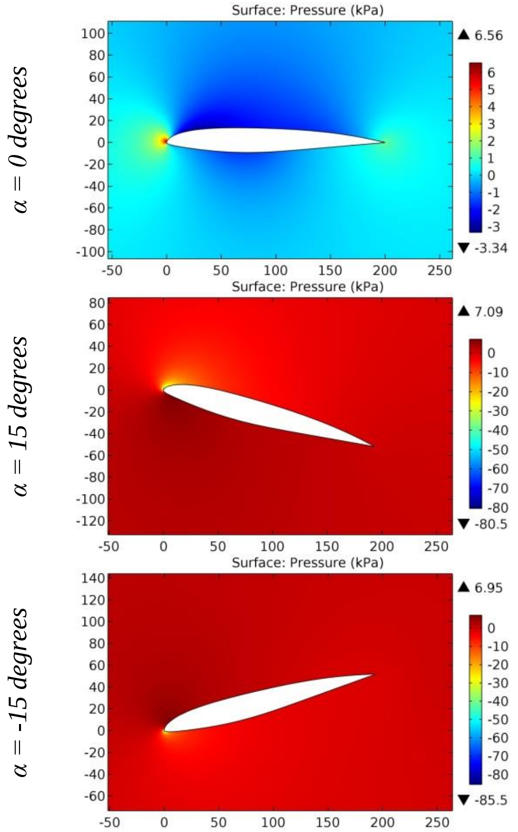


Figure 109. The pressure contours on the surfaces of the BOEING BACXXX airfoil.

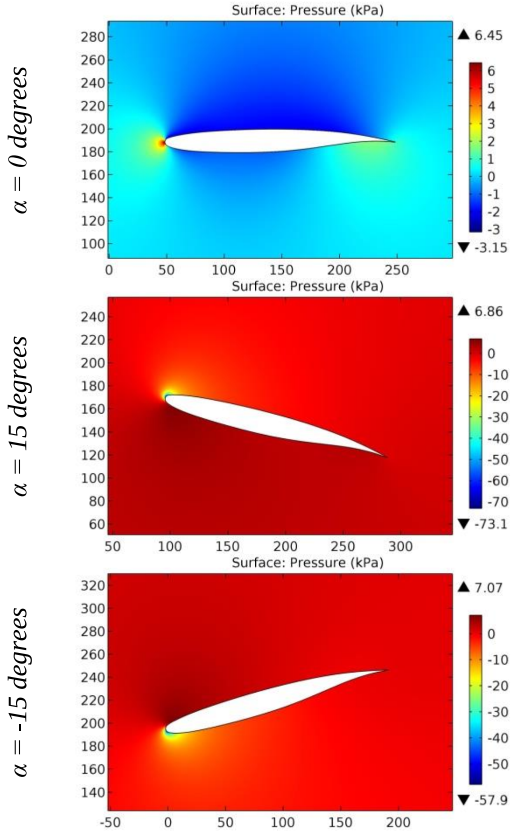


Figure 110. The pressure contours on the surfaces of the Boeing Commercial Airplane Company airfoil J.

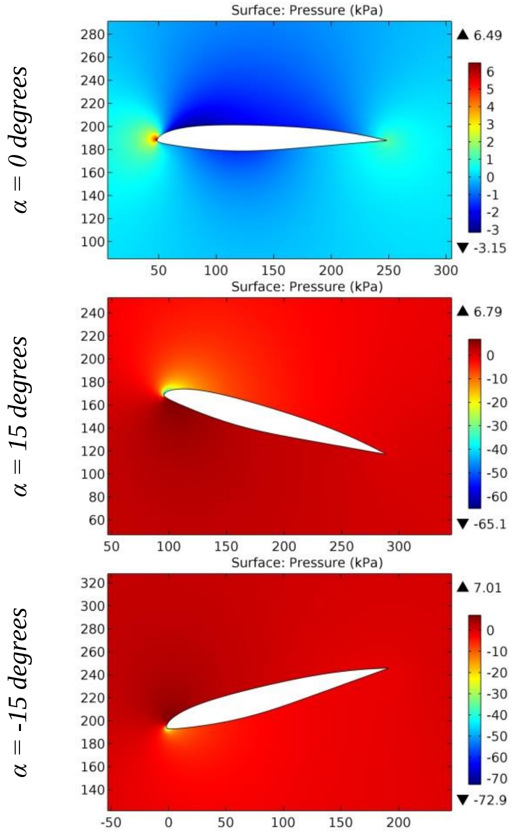


Figure 111. The pressure contours on the surfaces of the Boeing (Commercial Airplane) BACXXX airfoil.

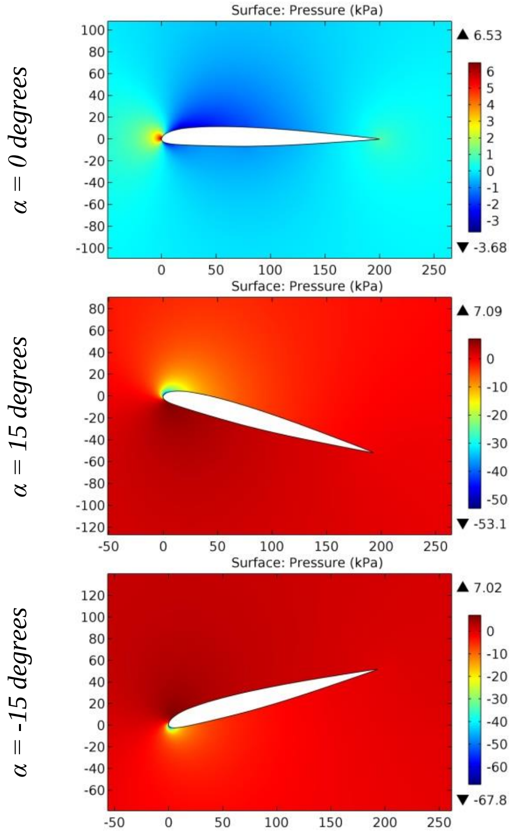


Figure 112. The pressure contours on the surfaces of the BOEING VERTOL V(1,95)3009-1,25 airfoil.

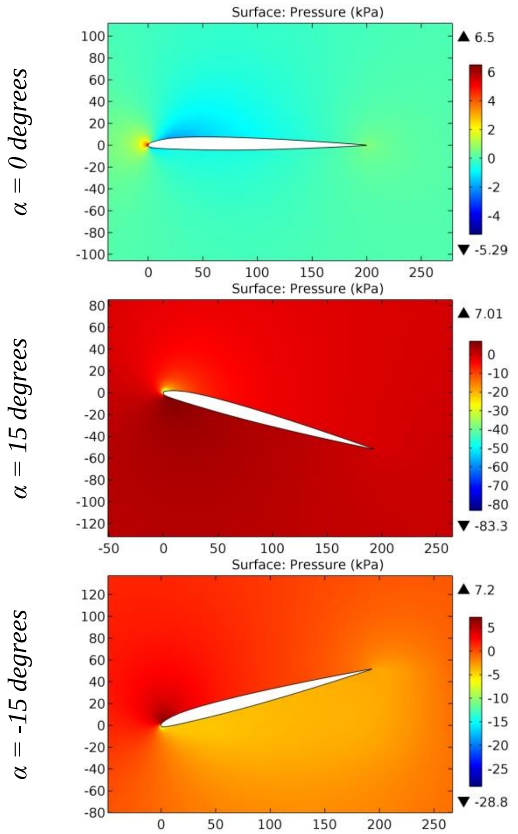


Figure 113. The pressure contours on the surfaces of the BOEING VERTOL V13006-,7 airfoil.

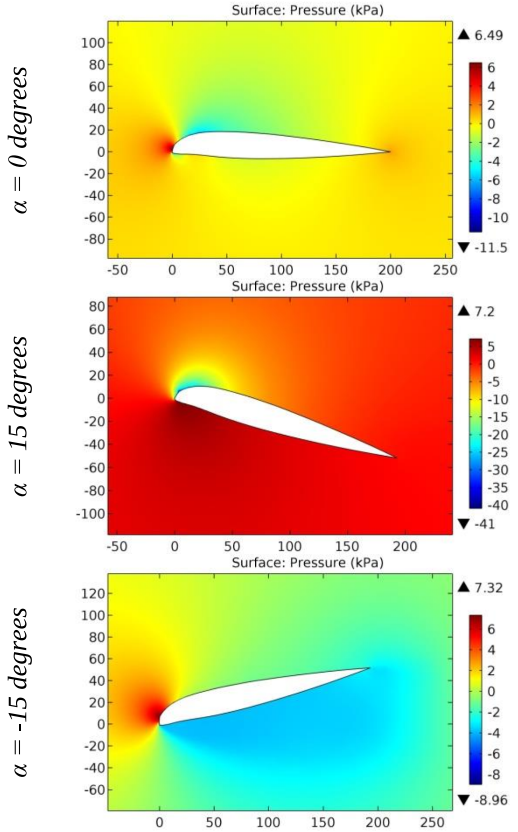


Figure 114. The pressure contours on the surfaces of the BOEING VERTOL V43012-1,58 airfoil.

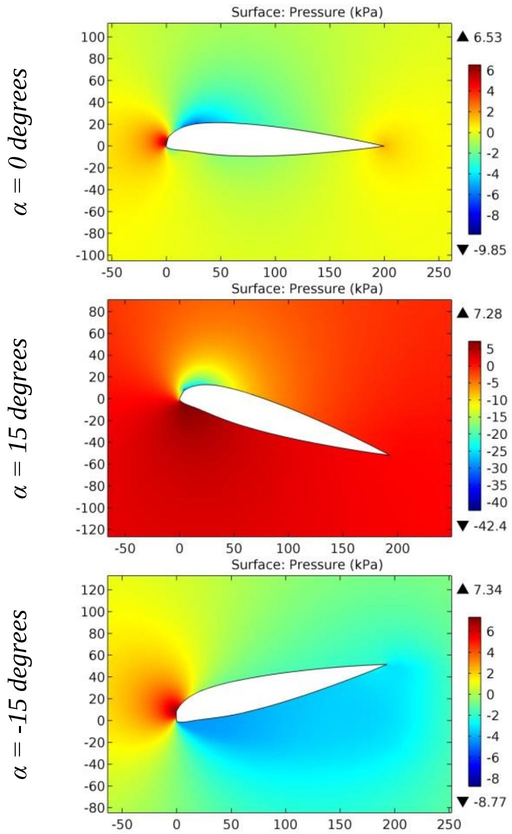


Figure 115. The pressure contours on the surfaces of the BOEING VERTOL V43015-2,48 airfoil.

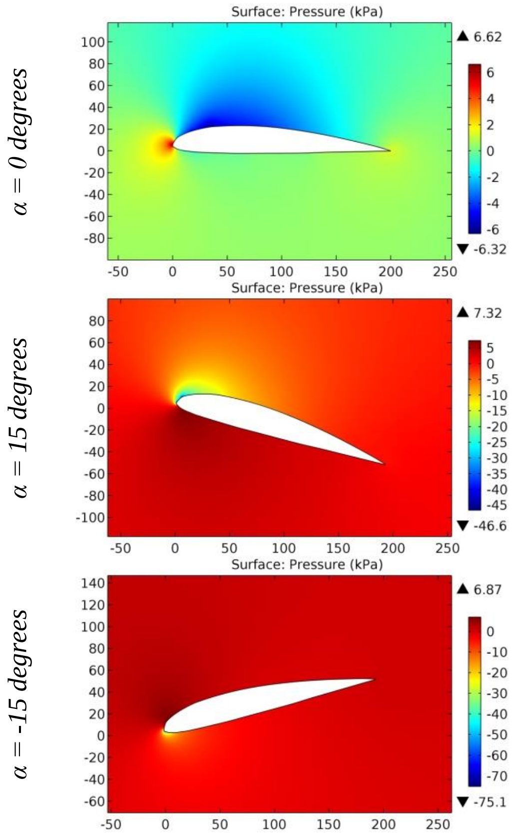


Figure 116. The pressure contours on the surfaces of the BOEING10 airfoil.

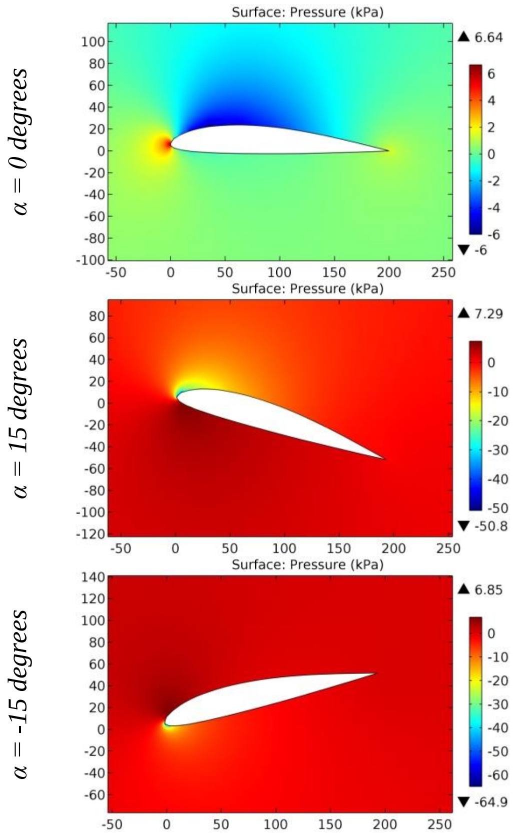


Figure 117. The pressure contours on the surfaces of the BOEING16 airfoil.

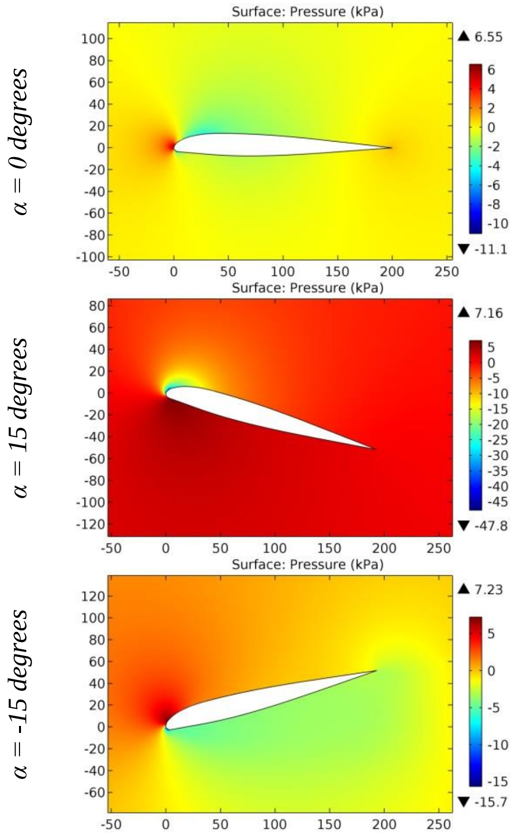


Figure 118. The pressure contours on the surfaces of the BOEING-VERTOL V23010-1,58 airfoil.

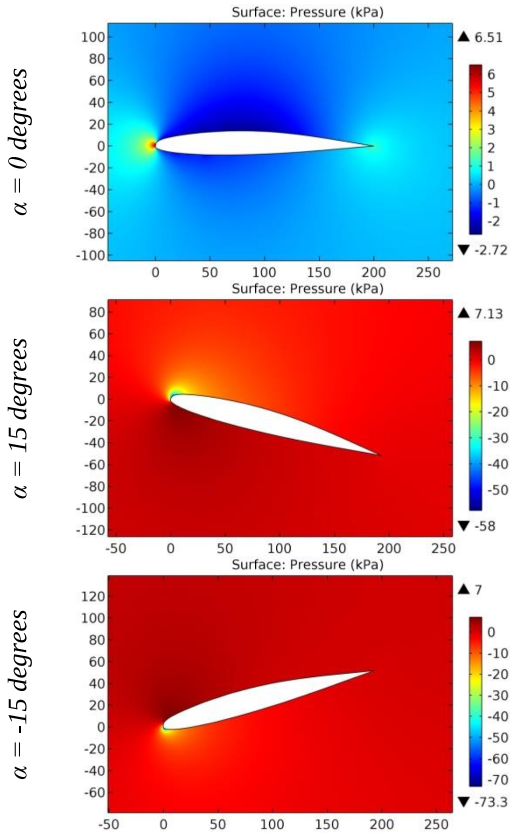


Figure 119. The pressure contours on the surfaces of the BOEING-VERTOL VR-1 airfoil.

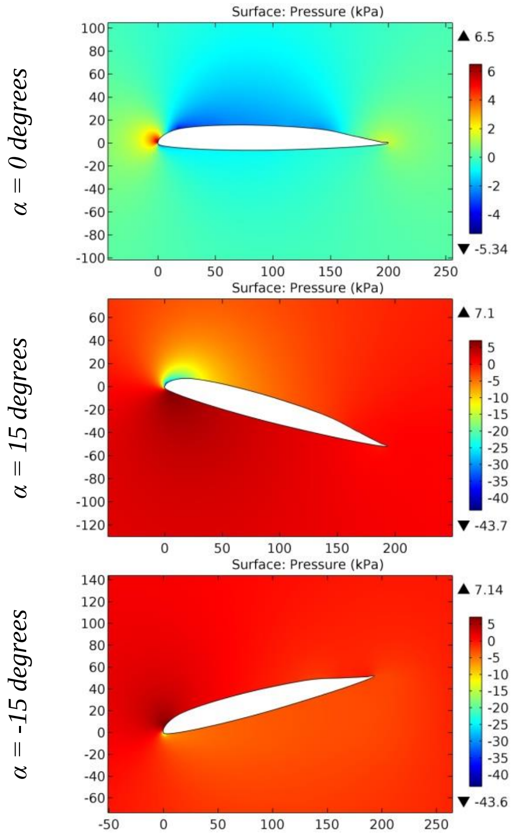


Figure 120. The pressure contours on the surfaces of the BOEING-VERTOL VR-11X airfoil.

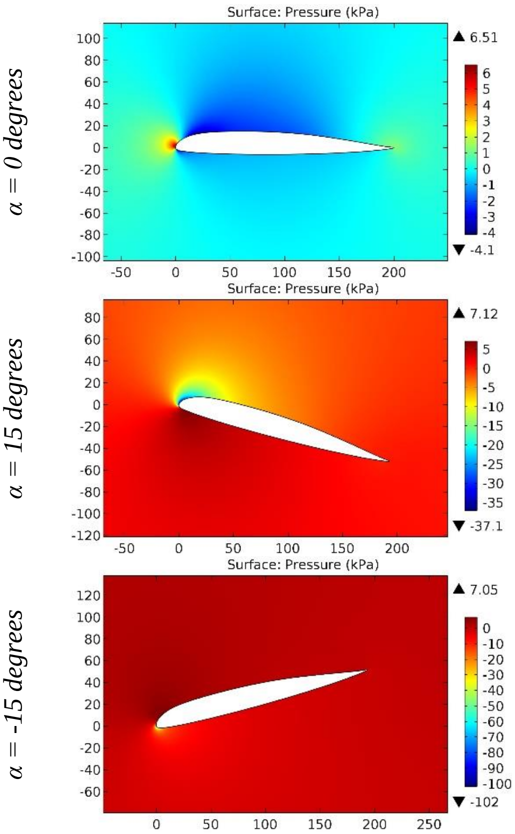


Figure 121. The pressure contours on the surfaces of the BOEING-VERTOL VR-12 airfoil.

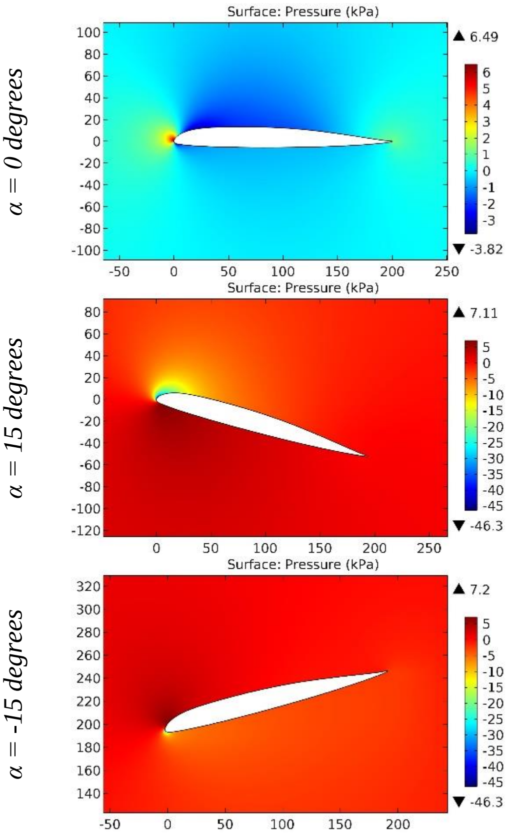


Figure 122. The pressure contours on the surfaces of the BOEING-VERTOL VR-13 airfoil.

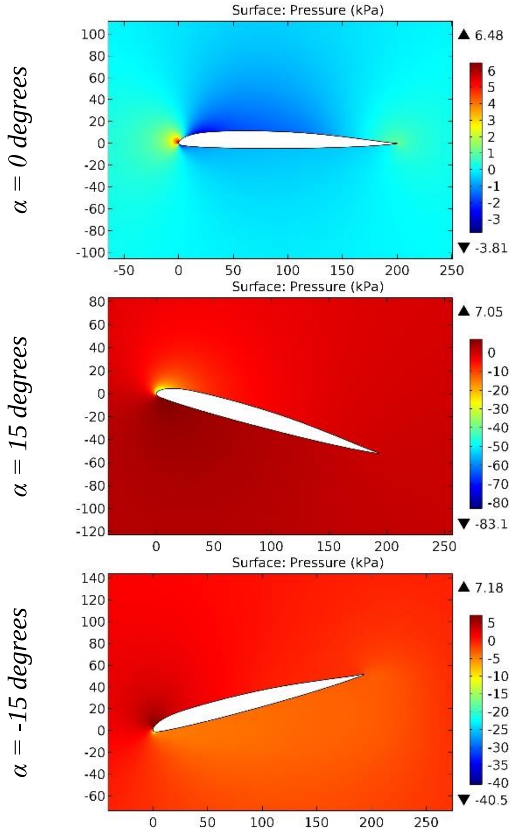


Figure 123. The pressure contours on the surfaces of the BOEING-VERTOL VR-14 airfoil.

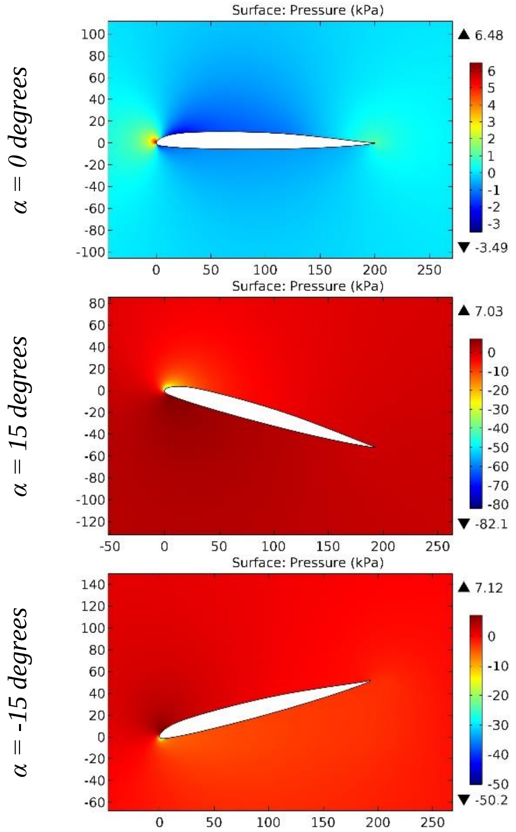


Figure 124. The pressure contours on the surfaces of the BOEING-VERTOL VR-15 airfoil.

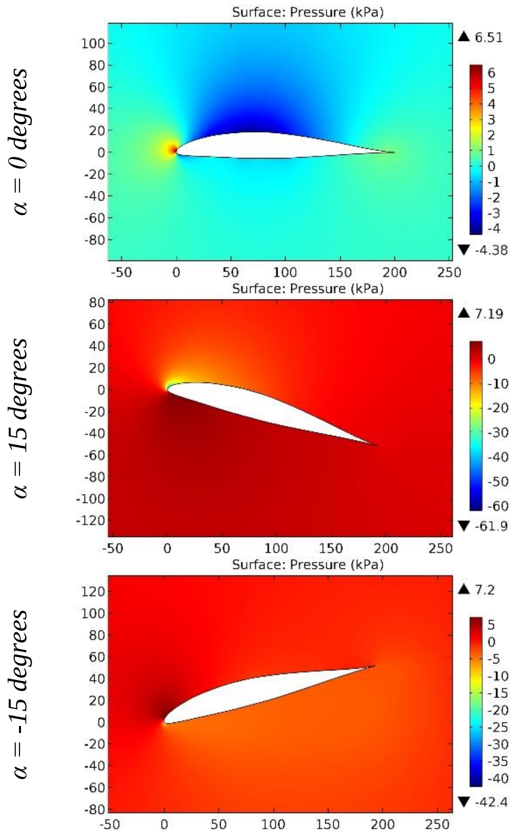


Figure 125. The pressure contours on the surfaces of the BOEING-VERTOL VR-5 airfoil.

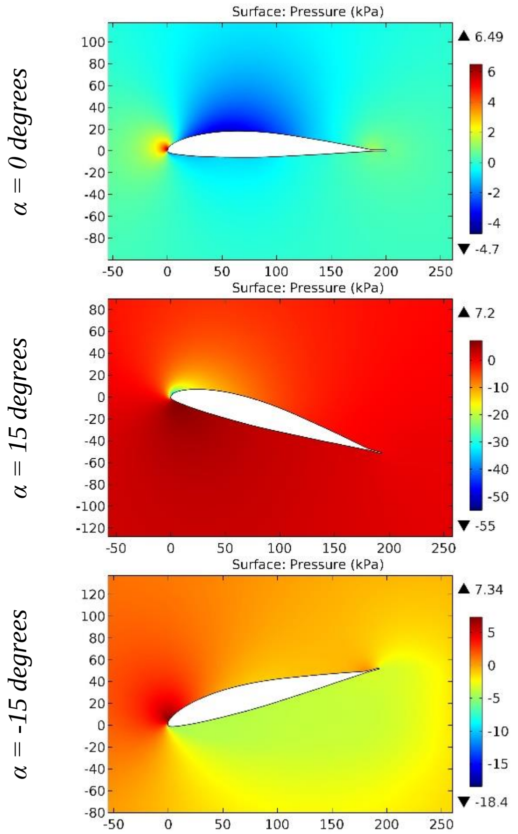


Figure 126. The pressure contours on the surfaces of the BOEING-VERTOL VR-7 airfoil.

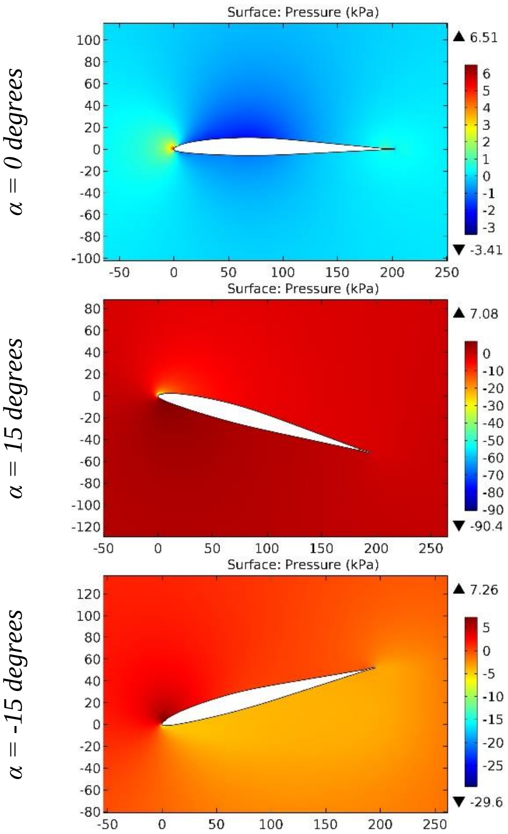


Figure 127. The pressure contours on the surfaces of the BOEING-VERTOL VR-8 airfoil.

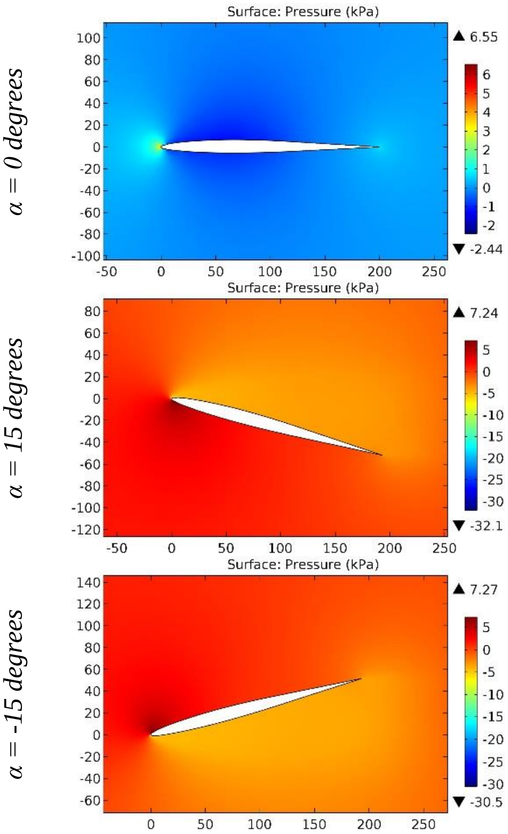


Figure 128. The pressure contours on the surfaces of the BOEING-VERTOL VR-9 airfoil.

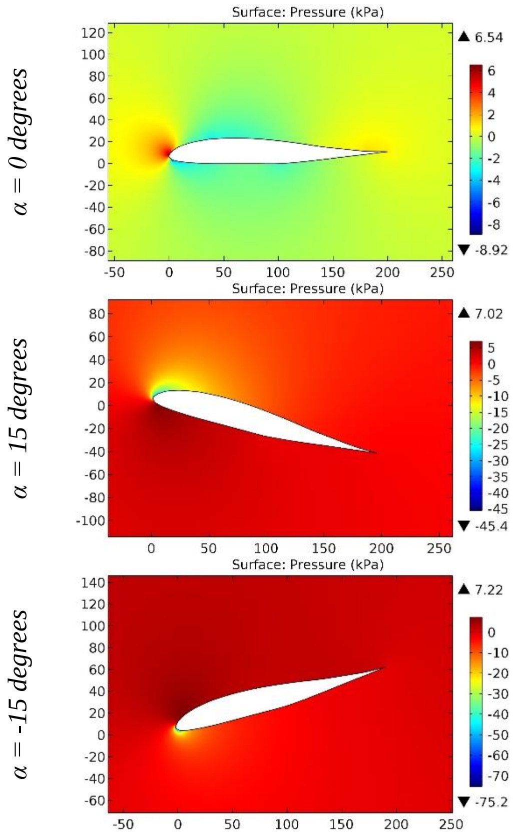


Figure 129. The pressure contours on the surfaces of the Borge' B3 airfoil.

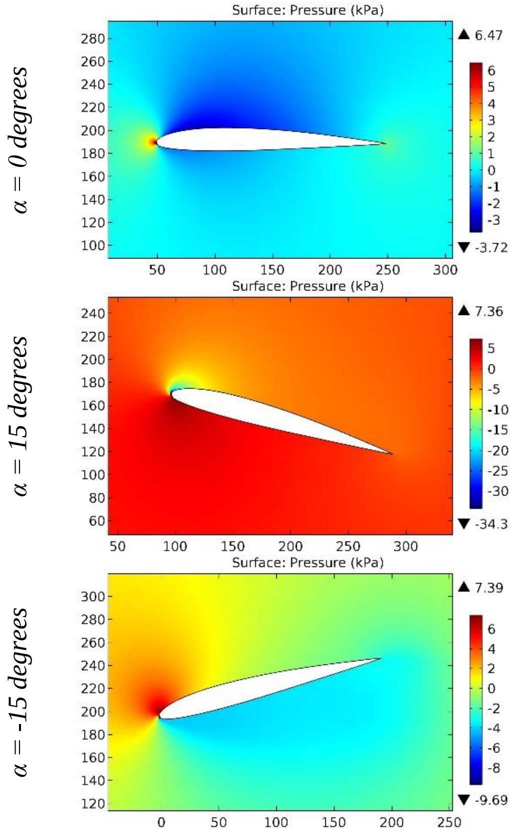


Figure 130. The pressure contours on the surfaces of the BP4D airfoil.

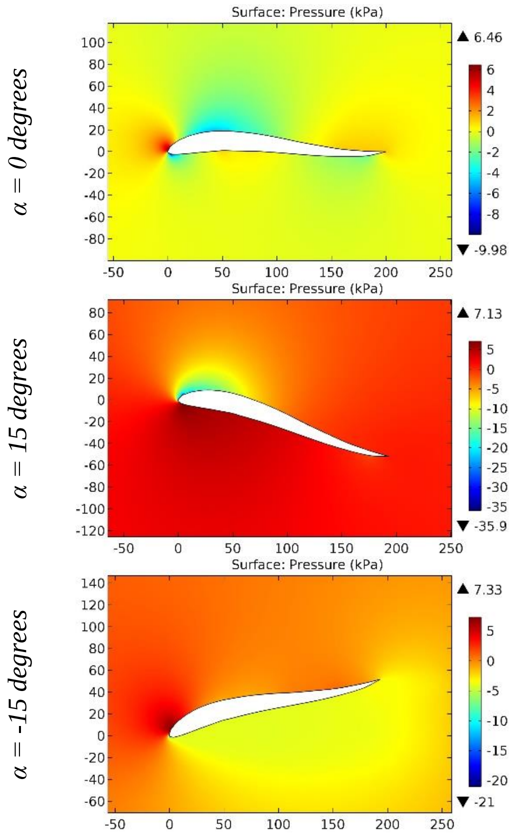


Figure 131. The pressure contours on the surfaces of the Broggini 55509 airfoil.

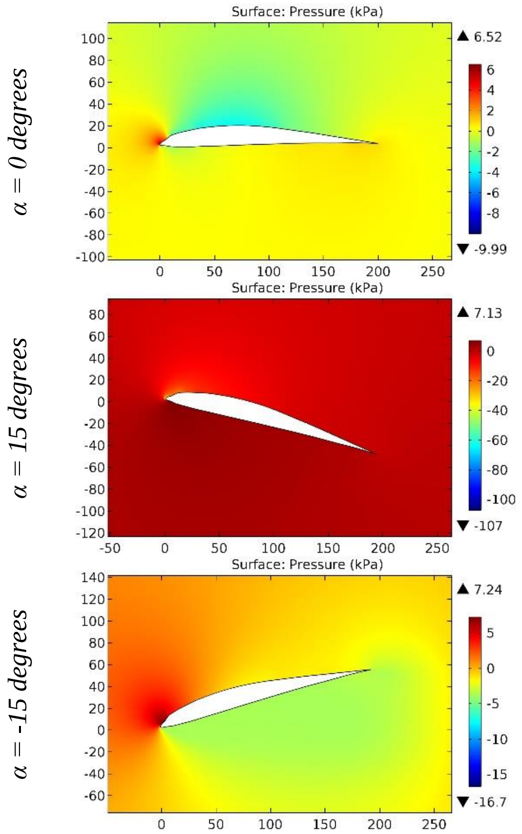


Figure 132. The pressure contours on the surfaces of the Brogly airfoil.

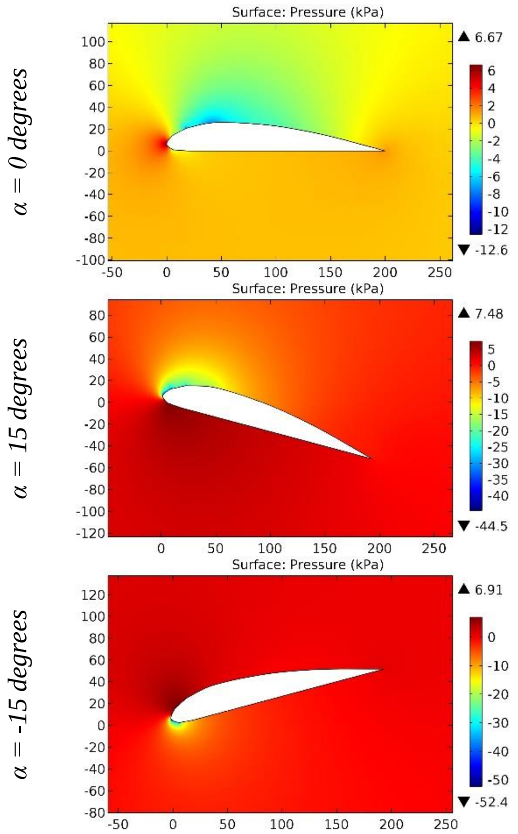


Figure 133. The pressure contours on the surfaces of the BRUXEL33 airfoil.

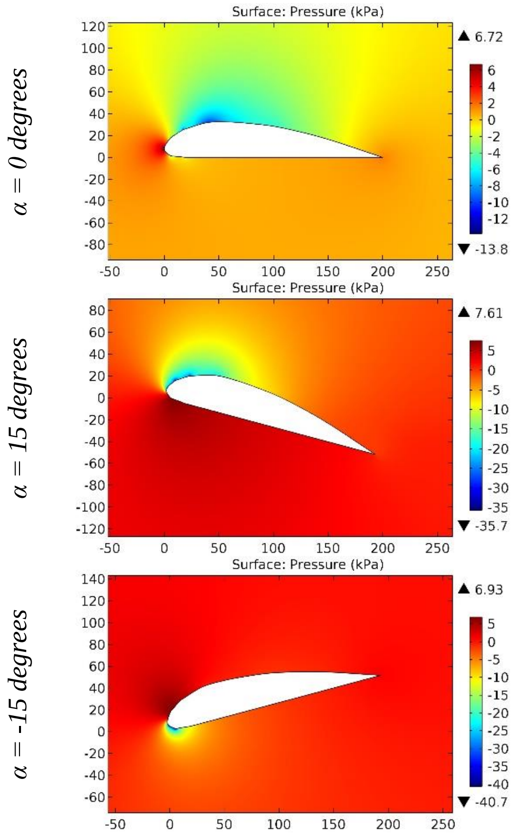


Figure 134. The pressure contours on the surfaces of the BRUXEL36 airfoil.

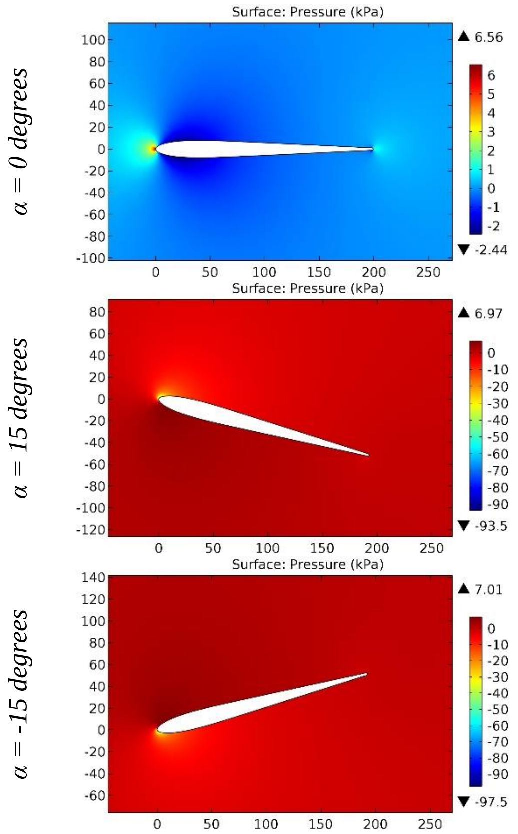


Figure 135. The pressure contours on the surfaces of the BTP8 airfoil.

The BE airfoils series is characterized mainly by an increase in pressure on the surfaces during the take-off maneuver of the airplane and a decrease in pressure during the landing maneuver of the airplane due to the thickness of the airfoil (thin and medium thickness). With an increase in the thickness of the airfoil (for example, the BOEING, B-29, BA, Blanchard, Bruxel airfoils series), the nature of pressure distribution on the surfaces changes inversely. The most advantageous geometry was determined for the Benedek 1053 B airfoil. The minimum magnitudes of the gradients of positive and negative pressures on the upper and lower surfaces and the leading edge of this airfoil were calculated at 15 and -15 degrees.

In the least favorable conditions, flight of the airplane having the wing with the large curvature in the cross section is carried out. For example, at the leading edge of the BE3307B airfoil, maximum drag occurs when air flows around at the angle of attack of 0 and 15 degrees. However, with the negative angle of attack, pressure on the surfaces of the airfoil is significantly reduced to the calculated magnitudes of pressure that occurs with the similar angle of attack of the biconvex symmetrical airfoils.

Maximum increase in negative pressure on the leading edge occurs at the angle of attack of -15 degrees for some airfoils (B-29 ROOT, BA 19, BE12305B, BE12355D, BE 9403B, BELL 540, BELL-WORTMANN FX 69-H-098, Benedek 10355 B, Benedek 12355 B, Benedek 9403 B, BOEING 103, BOEING 106, BOEING 707 ,08 SPAN, BOEING 707 ,19 SPAN, BOEING 707 .19 SPAN AIRFOIL, BOEING 737 MIDSPAN AIRFOIL, BOEING 737 ROOT, BOEING 737 ROOT AIRFOIL, Boeing B-29 root airfoil, BOEING BACXXX, Boeing Commercial Airplane Company BACXXX, BOEING VERTOL V(1,95)3009-1,25, BOEING10, BOEING16, BOEING-VERTOL VR-1, BOEING-VERTOL VR-12, Borge' B3, BRUXEL33, BRUXEL36, BTP8). The BOEING-VERTOL VR-13 airfoil is subjected to the same positive and negative pressures under conditions of changing the angle of attack by 15 and -15 degrees. Maximum increase in negative pressure on the leading edge occurs at the angle of attack of 15 degrees for the remaining airfoils.

Conclusion

The airfoils of the wings of the first airplanes (BE3259B, BE3307B, BE309B, BE3357B, BE3359B) were imperfect. Analysis of the results of computer calculations revealed the occurrence of the large drag on the leading edge of these airfoils in conditions of horizontal flight and climb of the airplane. Good aerodynamic properties are shown by the S-shaped airfoils and the airfoils with the thickness of more than 12%.

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SYNTHESIS OF HYDROGELS BASED ON COTTON CELLULOSE, UREA AND ACRYLIC ACID

Abstract: *The aim of this study is to synthesize a new composition of an agricultural hydrogel based on cotton cellulose, urea, and acrylic acid. The results of scanning electron microscopic (SEM), infrared spectroscopic (IR) and differential scanning calorimetric (DSK) analysis of the obtained superabsorbent hydrogel were also analyzed. All analysis results in this study confirmed the formation of a new superabsorbent hydrogel. The water absorption capacity of the superconducting hydrogel was 460 g/g. According to the results of the study, a mechanism for the reaction of the formation of a superabsorbent hydrogel was proposed.*

Key words: *cotton cellulose, urea, synthesis, hydrogel, acrylic acid, polymerization, initiator, binding agent, water absorption.*

Language: *Russian*

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Scopus ASCC: *1604.*

СИНТЕЗ ГИДРОГЕЛЕЙ НА ОСНОВЕ ХЛОПКОВОЙ ЦЕЛЛЮЛОЗЫ, МОЧЕВИНЫ И АКРИЛОВОЙ КИСЛОТЫ

Аннотация: *Целью данного исследования является синтез новой композиции сельскохозяйственного гидрогеля на основе хлопковой целлюлозы, мочевины и акриловой кислоты. Также были проанализированы результаты сканирующего электронного микроскопа (СЭМ), инфракрасной спектроскопии (ИК) и дифференциальной сканирующей калориметрии (ДСК) полученного суперабсорбирующего гидрогеля. Все результаты анализа в этом исследовании подтвердили образование нового супервпитывающего гидрогеля. Водопоглощающая способность сверхпроводящего гидрогеля составляла 460 г/г. По результатам исследования был предложен механизм реакции образования суперабсорбирующего гидрогеля.*

Ключевые слова: *хлопковая целлюлоза, мочевина, синтез, гидрогель, акриловая кислота, полимеризация, инициатор, связующее, водопоглощение.*

Введение

Согласно определению, гидрогели представляют собой такие сшитые полимерные вещества, которые остаются нерастворимыми и могут удерживать большие количества жидкости по сравнению с массой тела [1]. Сшивание можно проводить химическим или механическим способом. Благодаря более высокой водопоглощающей способности гидрогелей, его можно использовать в здравоохранении [2], сельском хозяйстве [3], биомедицине [4], строительстве [5] и других промышленных применениях [6].

Целлюлоза - самый распространенный природный полимер на этой планете. Не только в настоящее время, но и с древних времен целлюлоза используется в промышленности и других различных областях [7]. В сочетании с целлюлозой и другими синтетическими полимерами можно синтезировать композитный гидрогель с особыми свойствами [8]. Среди различных методов получения гидрогелей наиболее широко используется метод радикальной сополимеризации из-за простого протекания реакции и менее дорогих инструментов. При радикальной сополимеризации мономеры сополимеризуются в присутствии инициаторов и сшивающего агента и прививаются на целлюлозные материалы.

Регулярное использование удобрений, особенно азотных, в сельском хозяйстве может вызвать экологические проблемы. Мочевина - наиболее широко используемое удобрение из-за высокого содержания азота (46%). Удобрения можно добавлять в гидрогель разными способами, два наиболее часто используемых метода: один - удобрение приваривается непосредственно к полимерным цепям гидрогеля, другой - сначала синтезируется гидрогель, а затем он погружается в растворы минеральных удобрений [9-10]. Эффективность поглощения мочевины растениями обычно колеблется до 50% из-за потока воды, промывки и испарения, что приводит к накоплению мочевины в воде и почве и вызывает очень серьезные экологические проблемы [10-11]. Технологической науке необходимы инновации в синтезе гидрогелей. Поэтому в этой статье мы синтезировали новый состав сельскохозяйственного гидрогеля, который можно обновить, сочетая синтетический материал с натуральными материалами.

Объекты и методы исследования.

В эксперименте использовались хлопковая целлюлоза (ХЦ) (Узбекистан), акриловая кислота (АК) (Навоиазот, Узбекистан), мочевина (Навоиазот, Узбекистан), NaOH (пром.УЗ) - N,N '-метиленнебисакриламид (MBA, Chemical Ltd, Англия), инициатор - реагенты персульфат калия (КПС)

Растворение хлопковой целлюлозы (ХЦ)

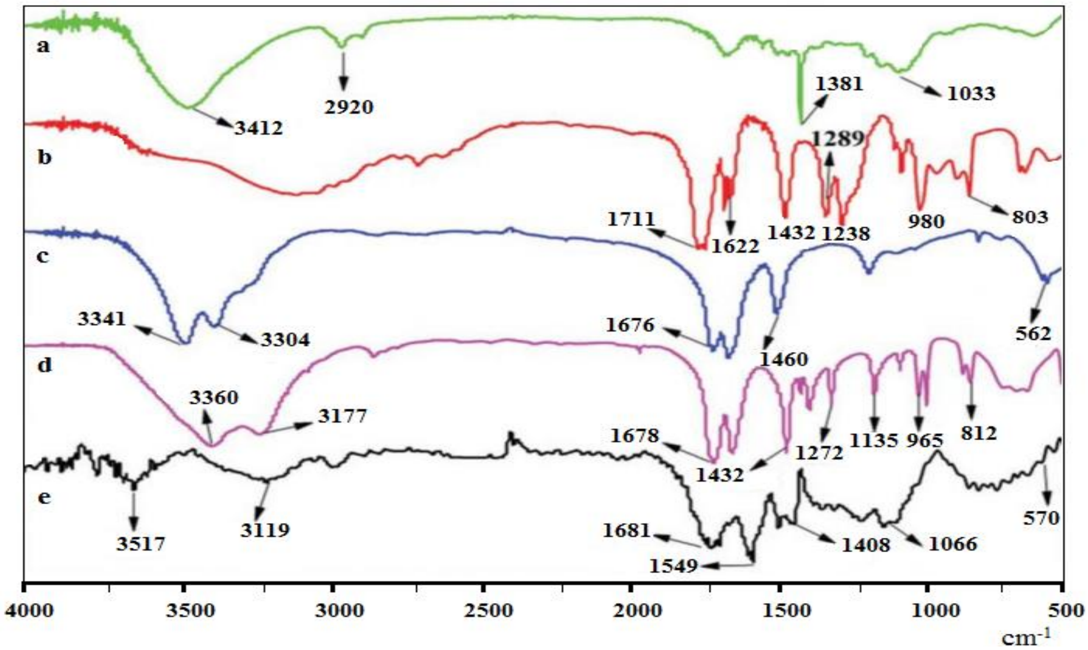
5 г хлопковой целлюлозы нагревали в 10% растворе NaOH в автоклаве при 100 °C в течение 3 часов. Полученный материал промывали дистиллированной водой до чистотого состояния и сушили до постоянной массы при 60 °C. Затем материал погружали в 7% раствор LiOH и 12% мочевины и держали при -30 °C в течение 24 часов. В этом процессе гидраты LiOH окружают цепочку целлюлозы, образуя новые водородные связи при низких температурах. В этом случае, в результате смещения водородных связей между целлюлозой и небольшими молекулами, целлюлоза растворяется в водном растворе. Полученный продукт очень энергично перемешивают в течение 1 часа, в результате получается каша из хлопковой целлюлозы. Затем продукт фильтровали и промывали до тех пор, пока pH промывной воды не достигал = 7.

Синтез гидрогеля.

Гидрогель получали следующим образом. Первоначально 1 моль АК нейтрализовали до 70% на ледяной бане в присутствии 20% раствора NaOH в химическом стакане на 500 мл. Затем к нему медленно добавляли 2 моля мочевины и 0,216 г МБА и хорошо перемешивали механической мешалкой. Полученный раствор затем переносили в трехгорлую колбу на 1000 мл, оборудованную механической мешалкой, газообразным азотом и конденсатором. Трехгорлую трубку погружали в водяную баню. Перед добавлением инициатора кислород, присутствующий в растворе, удаляли из раствора в присутствии газообразного азота в течение 20 мин. Затем в указанную колбу добавляли 14,4 г хлопковой целлюлозы и 0,432 г КПС при перемешивании в течение 10 мин. Для завершения процесса полимеризации водяную баню доводили до установленной температуры в течение определённого времени. Реакцию проводили при 70 °C в течение 4 часов. После завершения реакции полимеризации полученный гидрогель промывали этанолом для удаления инертных частиц. Затем полученный гидрогель сушили при температуре 60°C до постоянного веса.

Результаты и их обсуждение.

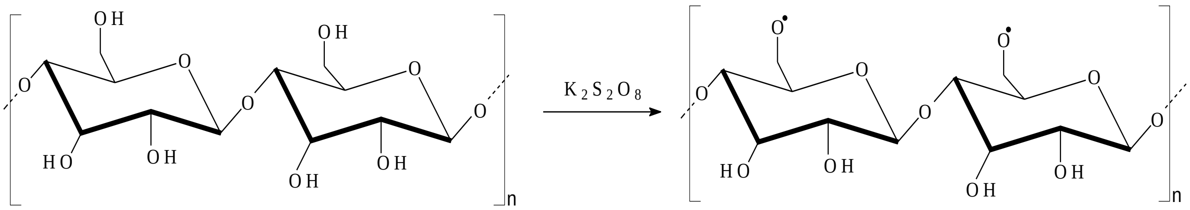
На рисунке 1 показаны ИК-спектры ХЦ, АК, мочевины и ХЦ-g-ПАК/Мочевины. Для спектра ХЦ области поглощения 3412 и 2920 см$^{-1}$ соответствуют валентным колебаниям групп -OH и C-H. Кроме того, пики 1386 и 1039 см$^{-1}$ зависят от асимметричных валентных колебаний C-C и C-O-C. Для спектра АК наблюдались области поглощения 1711 и 1622 см$^{-1}$, соответствующие валентным колебаниям групп –COOH и C=C соответственно. Симметричные колебания -COO⁻ групп наблюдались в области 1432 см$^{-1}$. В то время, как в области 1289 и 1238 см$^{-1}$ наблюдаются асимметричные колебаниями деформации =C-H, симметричные валентные колебания групп C-H наблюдаются в области 980 и 803 см$^{-1}$. Для мочевины площадь поглощения 3341 и 3304 см$^{-1}$ уменьшается до -CONH 1676 см$^{-1}$ асимметричной области деформации из-за валентных колебаний NH. Области поглощения 3341 и 3304 см$^{-1}$ обусловлены валентностью группы -N -H в метиленбисакриламиде, а площади поглощения 965 и 812 см$^{-1}$ обусловлены колебаниями деформации C-H.



Ріс 1. Инфракрасный спектр ХЦ (a), АК (b), мочевина (c), МБА (d) и ХЦ-g-ПАК/Мочевина (e)

На рисунке 1 ИК (e), новая полоса присутствует в спектре, которая указывает на прививку мономера на основу хлопка. Для валентных колебаний –COO⁻ группы соответствует область поглощения 1549 см$^{-1}$, симметричные валентные колебания групп –COO⁻ соответствуют области 1408 см$^{-1}$, симметричные валентные колебания групп C-O-C при 1066 см$^{-1}$. Кроме того, валентные колебания группы C=O в мочевине наблюдаются в области 1681 см$^{-1}$. Это означает, что химическая связь образуется между -COOH и C=O за счет водородной связи. Кроме того, можно видеть, что характерные связи мочевины уменьшаются с 3341 и 3304 см$^{-1}$ до 570 см$^{-1}$ (N-CO-N). Видно, что мочевина содержит ХЦ-g-ПАК/Мочевина.

Структурная формула суперабсорбирующего гидрогеля, который обладает способностью поглощать большие количества воды, оказалась следующей. (Схема - 1).



Целлюлоза **R* - Целлюлоза**

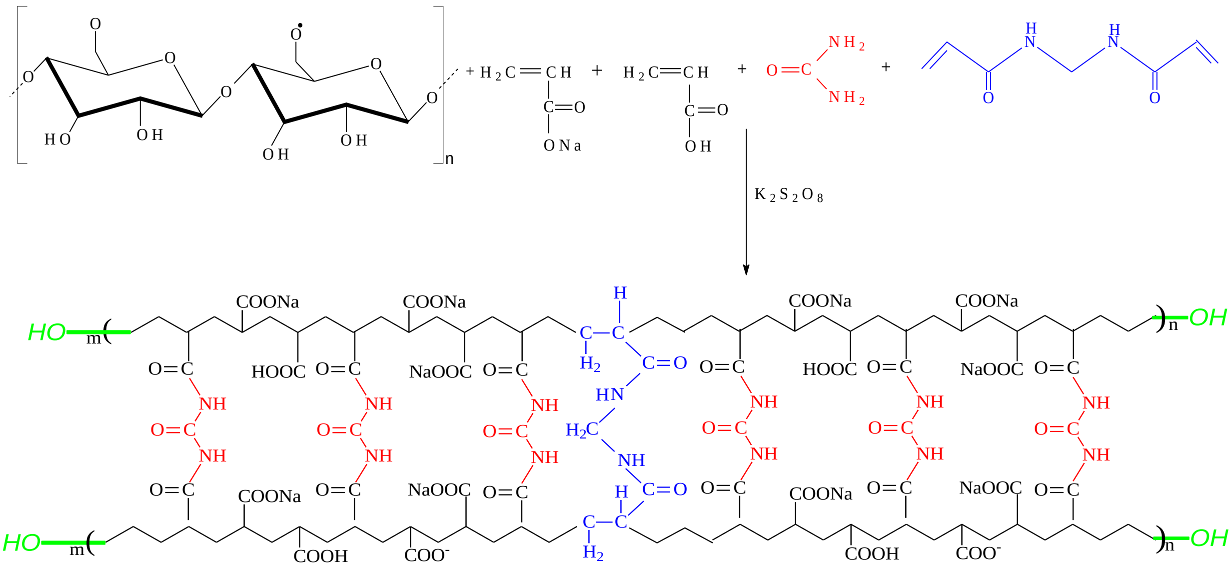


Схема 1. Реакция образования суперабсорбента гидрогеля (ХЦ-g-ПАК/Мочевин)

Микроморфологическое изображение гидрогеля (рис 2 б) показало, что гидрогель содержит большое количество пор, размер которых составляет около 0,1 мм. Эти поры улучшают водопоглощение гидрогелей, позволяя воде проникать внутрь гидрогеля. Пузырьки также играют важную роль в возвращении поглощенной воды растениям в нужное время. Кроме того, удобрения, присутствующие в гидрогелях, легко переносятся на стебель растения через поры в гидрогелях, полученных в результате сшивания ХЦ, АК и мочевины. На рисунке 2b мы можем видеть кристаллы мочевины (белые точки) на поверхности ХЦ-g-PAK/Мочевина, которые не прореагировали.

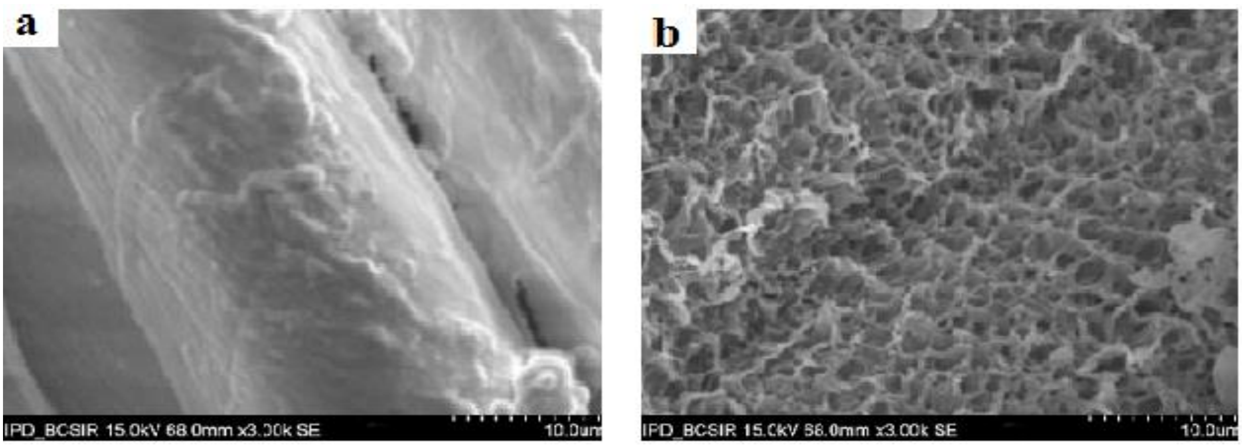


Рис 2. Морфология производной целлюлозы (a) и гидрогеля (ХЦ-g-ПАК/Мочевина) (b)

Влияние температуры реакции от 20 до 70 °C на скорость набухания гидрогеля исследовали без изменения других параметров. (Рис 3) На рис 3 показано, что водопоглощение полученного гидрогеля значительно увеличивалось, когда реакцию проводили при 60 °C. Когда реакции проводили при низких или высоких температурах, водопоглощающая способность гидрогеля также была низкой и полученная цепь была короткой. Увеличение времени реакции приводит к увеличению степени сшивания полимеров, что, в свою очередь, приводит к снижению водопоглощения гидрогеля. Таким образом, если время реакции слишком велико или слишком мало, а температура ниже или выше нормы, гидрогели будут поглощать меньше воды.

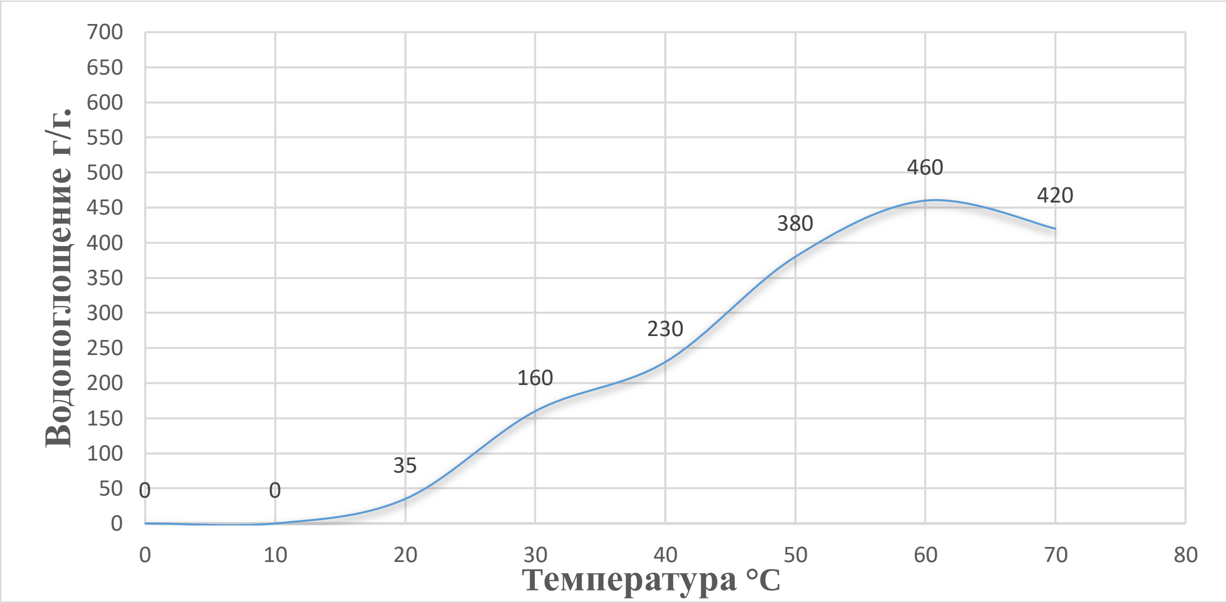


Рис 3. Влияние температуры реакции на водопоглощение.

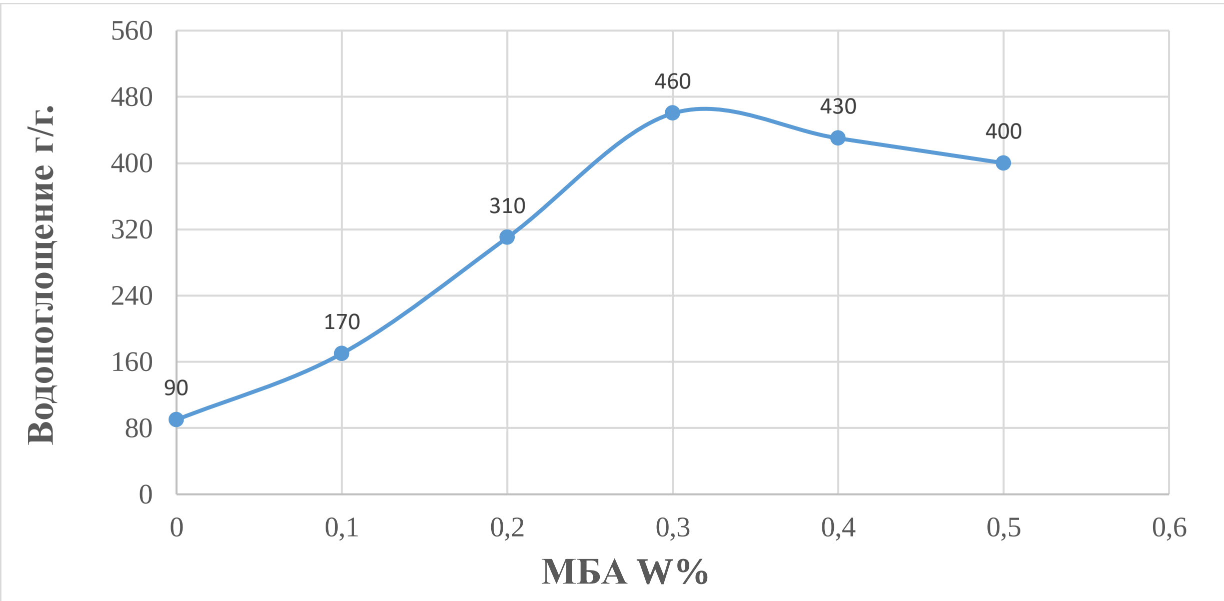


Рис 4. Влияние соотношения качества МБА и АК на водопоглощение .

Когда отношение количества связующего (МБА) к массе акриловой кислоты (АК) превышает 0,3%, водопоглощение гидрогеля уменьшается (Рисунок 4). По мере увеличения концентрации связующего количество петель в полимерной цепи увеличивается, и связи в полимере становятся более плотными из-за разрыва связей. Это также уменьшает объем пустот в сетках, что приводит к увеличению нерастворимого материала, что, в свою очередь, снижает водопоглощение суперабсорбирующего полимера.

Когда концентрация инициатора составляла 0,6% от массы акриловой кислоты, водопоглощающая способность гидрогеля показывала лучший результат. Высокая водопоглощающая способность гидрогеля в дистиллированной воде составляла 460 г/г. (Рисунок 5). Увеличение количества инициатора снижает водопоглощение гидрогеля. Увеличение количества инициатора создает большое количество радикальных центров, что приводит к неупорядоченному связыванию мономеров. Кроме того, когда количество инициатора (КПС) увеличивается, процесс реакции может остановиться до окончания реакции.

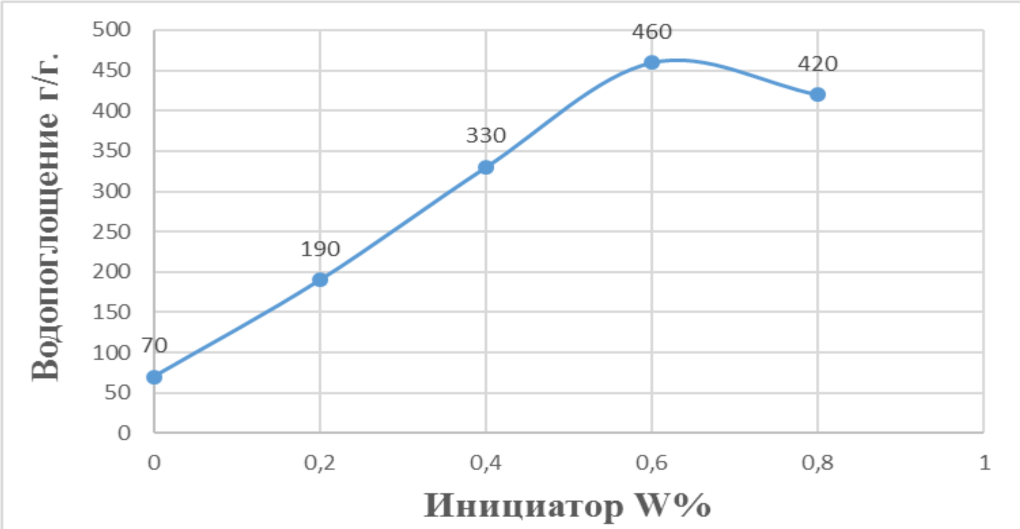


Рис 5. Влияние количества инициатора на водопоглощение.

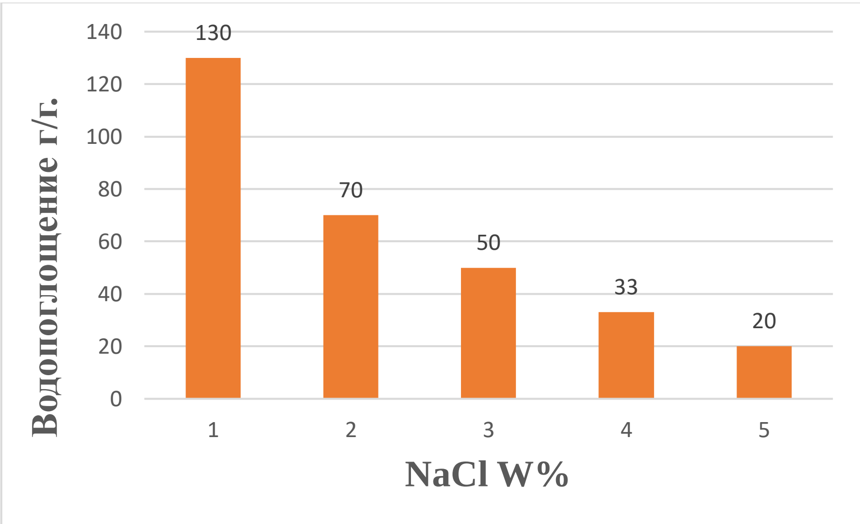


Рис 6. Влияние концентрации хлорида натрия на водопоглощение гидрогеля.

Как видно из рисунка 6, водопоглощающая способность ХЦ-g-ПАК/ Мочевина обратно пропорциональна концентрации раствора хлорида натрия. Это связано с уменьшением разницы осмотического давления с увеличением концентрации соли в растворе. Высокие концентрации NaCl раствора приводят к снижению водопоглощающей способности. Разница осмотического давления действует как движущая сила в фазе водопоглощения ХЦ-g-ПАК/Мочевины. Следовательно, гидрогели обладают сильной водопоглощающей способностью в растворе NaCl с низкой концентрацией.

Выводы

В этом исследовании были синтезированы сельскохозяйственные гидрогели, которые были экологически чистыми, путем прививки хлопковой целлюлозы, мочевины и акриловой кислоты в растворе с использованием метода прививки сополимеризации. По результатам исследования предложен реакционный механизм образования гидрогеля. Полученные гидрогели подходят для орошаемых, но неиспользуемых земель из-за нехватки воды, повышают урожайность сельскохозяйственных культур, сокращают потребление минеральных удобрений, удерживая их в плодородном слое почвы, и сохраняют их в почве за счет атмосферных осадков или воды для орошения, что снижает затраты.

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NONLOCAL PROBLEM FOR A HYPERBOLIC EQUATION DEGENERATING INSIDE A DOMAIN WITH A SINGULAR COEFFICIENT

Abstract: *Nonlocal boundary value problem with general conjugation conditions for a hyperbolic equation degenerating inside the domain with singular coefficients.*

Key words: *nonlocal problem, hyperbolic equation, singular coefficient.*
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Introduction

1. Statement of the problem G.

Consider the equation

$$-|y|^m u_{xx} + u_{yy} - \frac{m}{2y} u_y = 0, m > 0. \qquad (1)$$

Let Ω be a finite simply connected domain of the plane of independent variables x, y, bounded by the characteristics

$$\left.\begin{matrix} AC_1 \\ BC_1 \end{matrix}\right\}: \rightleftarrows x \mp \frac{2}{m+2} y^{\frac{m+2}{2}} = \mp 1, y > 0,$$

$$\left.\begin{matrix} BC_1 \\ BC_2 \end{matrix}\right\}: x \mp \frac{2}{m+2} (-y)^{\frac{m+2}{2}} = \mp 1, y < 0,$$

equation (1).

Task G. Find a regular solution in the field Ω

$$u(x,xy) = \begin{cases} u_1(x,xy), xx(x,xy) \in \Omega_1 = \Omega \cap \{y > 0\}, \\ u_2(x,xy), xx(x,xy) \in \Omega_2 = \Omega \cap \{y < 0\}. \end{cases}$$

equations (1) from the class $C(\bar{\Omega}_1 \cup \bar{\Omega}_2) \cap C^2(\Omega \backslash AB)$ satisfying the boundary conditions

$$u_j[\theta^{(j)}(x)] = \mu_1 u_j[\theta_{k_1}^{(j)}(x)] + \mu_2 u_j[\theta_{k_2}^{(j)}(x)] +$$
$$+\frac{1}{2}\mu_1 u_j(p_1(x),0) - \frac{1}{2}\mu_2 u_j(p_2(x),0) +$$
$$\delta_j(x), \forall x \in I = AB \qquad (2)$$

here, $j = 1$ corresponds to the area Ω_1, and $j = 2$ to the area Ω_2, $p_1(x) = a_1 + b_1 x, p_2(x) = a_2 + b_2 x$, where $a_i = \frac{2}{k_i+1}, b_i = \frac{k_i-1}{k_i+1}, i = 1,2$ and the pairing conditions

$$\lim_{y\to+0} u_1(x,y) = c \lim_{y\to-0} u_2(x,y), \forall x \in \bar{I} \qquad (3)$$

$$\lim_{y\to+0} y^{-\frac{m}{2}} \frac{\partial u_1}{\partial y} = \rho(x) \lim_{y\to-0} (-y)^{-\frac{m}{2}} \frac{\partial u_2}{\partial y} + \lambda(x), \forall x \in I \qquad (4)$$

where $\theta^{(j)}(x)(\theta_{k_1}^{(j)}(x), \theta_{k_2}^{(j)}(x))$

$$\theta^{(j)}(x_0) = \frac{1+x_0}{2} + (-i)^{j-1}\left[\frac{(m+2)(1-x_0)}{4}\right]^{\frac{2}{m+2}},$$

$$\theta_{k_1}^{(j)}(x_0) = \frac{1+k_1 x_0}{1+k_1} + (-i)^{j-1}\left[\frac{(m+2)(1-x_0)}{2(k_1+1)}\right]^{\frac{2}{m+2}},$$

$$\theta_{k_2}^{(j)}(x_0) = \frac{1+k_2 x_0}{1+k_2} +$$
$$+(-i)^{j-1}\left[\frac{(m+2)(1-x_0)}{2(k_2+1)}\right]^{\frac{2}{m+2}}$$

affix of the intersection point of the characteristic BC_j (curve $x + [2k_j/(m+2)]|y|^{(\tau+2)/2} = 1$, lying inside the area Ω_j) with a characteristic coming out of the point $M(x_0, 0) \in I$; $c = const$; $\mu_1, \mu_2 = const$; $\delta_j(x), \rho(x), \lambda(x)$ set functions from the class $C^2(\bar{I}) \cap C^3(I)$, where

$$\tau(1) = \tau'(1) = \tau''(1) = 0 \qquad (5)$$
$$\rho(x) - c \neq 0, k_1 > k_2 > 1, \delta_j^{(n)}(1) = 0,$$
$$\lambda^{(n)}(1) = 0, n = 0,1,2.$$

1. Study of problem G.

The theorem. Task *G* when conditions are met

$$\lambda_1 + \lambda_2 < 1, \quad (6)$$

where $\lambda_k = \frac{b_k\mu_k}{b_1\mu_1+b_2\mu_2-1} > 0, k = 1,2$ uniquely solvable.

Proof. 1. Consider the boundary condition (2). In the area Ω_1 the solution of the modified Cauchy problem [1] satisfying the conditions:

$$u_1(x,+0) = \tau_1(x), x \in \bar{I};$$

$$\lim_{y\to+0} y^{-\frac{m}{2}} \frac{\partial u_1}{\partial y} = \nu_1(x), x \in I \quad (7)$$

is given by the Dalembert formula [2]:

$$u(x,y) = \frac{\tau\left(x-\frac{2}{m+2}(-y)^{(m+2)/2}\right)+\tau\left(x+\frac{2}{m+2}(-y)^{(m+2)/2}\right)}{2} - \frac{(-y)^{(m+2)/2}}{m+2}\int_{-1}^{1}\nu\left[x+\frac{2t}{m+2}(-y)^{(m+2)/2}\right]dt, \quad (8)$$

From here it is easy to calculate that

$$u_1[\theta^{(1)}(x)] = \frac{1}{2}[\tau_1(x)+\tau_1(1)] - \frac{1}{2}\int_{-1}^{x}\nu_1(t)dt, \quad (9)$$

$$u_1\left[\theta^{(1)}_{k_1}(x)\right] = \frac{1}{2}[\tau_1(a_1+b_1x)+\tau_1(x)] - \frac{1}{2}\int_x^{a_1+b_1x}\nu_1(t)dt, \quad (10)$$

$$u_1\left[\theta^{(1)}_{k_2}(x)\right] = \frac{1}{2}[\tau_1(a_2+b_2x)+\tau_1(x)] - \frac{1}{2}\int_x^{a_2+b_2x}\nu_1(t)dt. \quad (11)$$

Now expressions (9)-(11), substituting into the boundary conditions (2), we obtain

$$\tau_1(x) - \int_x^1\nu_1(t)dt = \mu_1\tau_1(x) + \mu_2\tau_1(x) - \mu_1\int_x^{a_1+b_1x}\nu_1(t)dt + \mu_2\int_x^{a_2+b_2x}\nu_1(t)dt + 2\delta_1(x). \quad (12)$$

Relation (12) is the first functional relation between unknown functions $\tau_1(x)$ and $\nu_1(x)$ [3], brought to the axis $y = 0$ from the area Ω_1.

2. Now consider the boundary condition (2) in the area Ω_2 using the solution [2] of the modified Cauchy problem satisfying the conditions:

$$u_2(x,-0) = \tau_2(x), x \in \bar{I};$$

$$\lim_{y\to-0}(-y)^{-\frac{m}{2}}\frac{\partial u_2}{\partial y} = \nu_2(x), x \in I \quad (13)$$

it is easy to calculate that

$$u_2[\theta^{(2)}(x)] = \frac{1}{2}[\tau_2(x)+\tau_2(1)] - \frac{1}{2}\int_{-1}^{x}\nu_2(t)dt, \quad (14)$$

$$u_2\left[\theta^{(2)}_{k_1}(x)\right] = \frac{1}{2}[\tau_2(a_1+b_1x)+\tau_2(x)] - \frac{1}{2}\int_x^{a_1+b_1x}\nu_2(t)dt, \quad (15)$$

$$u_2\left[\theta^{(2)}_{k_2}(x)\right] = \frac{1}{2}[\tau_2(a_2+b_2x)+\tau_2(x)] - \frac{1}{2}\int_x^{a_2+b_2x}\nu_2(t)dt. \quad (16)$$

Expressions (14)-(16), substituting into the boundary conditions (2), we obtain

$$\tau_2(x) - \int_x^1\nu_2(t)dt = \mu_1\tau_2(x) + \mu_2\tau_2(x) - \mu_1\int_x^{a_1+b_1x}\nu_2(t)dt + \mu_2\int_x^{a_2+b_2x}\nu_2(t)dt + 2\delta_2(x). \quad (17)$$

Relation (17) is the second functional relation between unknown functions $\tau_2(x)$ and $\nu_2(x)$, brought to the axis $y = 0$ from the area Ω_2.

From (12) and (17) according to the conditions of conjugation (3), (4), i.e. taking into account the equalities: $\tau_1(x) = c\tau_2(x)$, $\nu_1(x) = \rho(x)\nu_2(x) + \lambda(x)$ excluding $\tau_2(x)$ from (12), we obtain the following integral equation with respect to an unknown function $\nu_2(x)$:

$$\int_x^1(\rho(t)-c)\nu_2(t)dt = \mu_1\int_x^{a_1+b_1x}(\rho(t)-c)\nu_2(t)dt + \mu_2\int_x^{a_2+b_2}(\rho(t)-c)\nu_2(t)dt + f(t) \quad (18)$$

where $f(x) = 2\delta_1(x) - 2c\delta_2(x) + \int_x^1\lambda(t)dt + \mu_1\int_x^{a_1+b_1x}\lambda(t)dt + \mu_2\int_x^{a_2+b_2x}\lambda(t)dt.$

(18) differentiating by x we get:

$$\nu(x) = \lambda_1(x)\nu(a_1+b_1x) + \lambda_2(x)\nu(a_2+b_2x) + f_1(x) \quad (19)$$

where

$$\nu(x) = (\rho(x)-c)\nu_2(x),$$

$$\lambda_1(x) = \frac{b_1\mu_1}{b_1\mu_1+b_2\mu_2-1},$$

$$\lambda_2(x) = \frac{b_2\mu_2}{b_1\mu_1+b_2\mu_2-1},$$

$$f_1(x) = \frac{1}{b_1\mu_1+b_2\mu_2-1}\frac{d}{dx}f(x).$$

Relation (19) is a functional equation.

We will look for the solution of the functional equation (19) in the class of functions bounded at a point $x = 1$. If we abandon this requirement, then the corresponding homogeneous functional equation (19)

$$\nu(x) = \lambda_1(x)\nu(a_1+b_1x) + \lambda_2(x)\nu(a_2+b_2x) \quad (20)$$

may have a non-trivial solution.

Example. Let $p_1(x) = a + bx, p_2(x) = p_1(p_1(x)) = b^2x + ba + a$, where $a - b = c_1, c_1b + a = c_2$, then it is not difficult to make sure that the function

$$\nu(x) = (1-x)^\delta, \text{ where } \delta = log_b\frac{\sqrt{\lambda_1^2+4\lambda_2}-\lambda_1}{2\lambda_2} \quad (21)$$

will be a nontrivial solution of the homogeneous equation (20), indeed, since

$$\nu(p_1(x)) = (1-p_1(x))^\delta = b^\delta(1-x)^\delta,$$

$$\nu(p_2(x)) = (1-p_2(x))^\delta = b^{2\delta}(1-x)^\delta,$$

then substituting these values into (20) we obtain the following quadratic equation $\lambda_2b^{2\delta} + \lambda_1b^\delta - 1 = 0.$

From here

$$\delta = log_b\frac{\sqrt{\lambda_1^2+4\lambda_2}-\lambda_1}{2\lambda_2}$$

and by virtue of condition (6) it is easy to make sure that $\delta < 0$, therefore, the solution (21) of the homogeneous functional equation (21) is not limited when $x = 1$.

Thus, the class of solutions where the solution of the functional equation (19) is sought is essential.

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YOUTH PRESS IN KARAKALPAKSTAN: PROBLEMS AND SOLUTIONS

Abstract: *This article discusses the role and importance of youth publishing in society at present. Therefore, the current state of the youth press in the Republic of Karakalpakstan will be analyzed and evaluated critically. At the same time, journalistic articles published in the youth press will be analyzed.*

Key words: *Publisher, newspaper, youth, educator, scientist, publicist, article, journalist, activity, culture, spirituality, population, society, youth press, problem and solution.*

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Introduction

Nowadays, the main layer of our society is young people and children. According to statistics, adolescent and children make up 60% of the population in Uzbekistan. This shows that more attention should be paid to this layer. We aim to consider these aspects in journalism, that is, in the example of the Karakalpak press. The first reason is that young people and their upbringing, as well as the latest developments in society and the future are directly related to their lives, secondly, journalism is exactly the press that is our object.

The main part

Attention to the upbringing of young people has long been one of the most pressing issues in the public eye. The reason is that young people are very different from adults with their enthusiasm, perspective, aspiration to knowledge, inquisitiveness and other qualities. Young people enrich the programs of enlightenment, culture, spirituality, traditions and customs left by their ancestors, take new places in the history of socio-political life with new initiatives and reforms. Therefore, the society lays the foundation for its future by educating young people, acquiring certain professions, shaping their worldview, developing their physical maturity and spiritual wealth. Our great ancestors Abu Nasr al-Farabi's “Ijtimoiy siyosat” (Social Policy), “Baxt-saodatga erishuv to’g’risida” (On the Achievement of Happiness), “Fozil odamlar shahri” (Town of Noble People), Nizam ul-Mulk's "Siyosatnoma" (Policy), "Ro’shnoma" (The guide), Yusuf Khas Hajib's "Kutadgu Bilig" (Knowledge that leads to happiness), Mahmud Kashgari’s "Devonu lug'atit turk", Kaykovus's "Qobusnoma", Ahmad Yugnaki's "Hibatul-haqoyiq", Alisher Navoi's "Mahbub ul-qulub", "Vaqfiya" are directly dedicated to the education of the next generation, especially about the youth. In these respects, these works are still fulfilling their educational function without losing their value.

Along with educational institutions, the role of the media in the education of young people is special. Because the media is the mainstay and “backbone” of society. Commenting on the concept of support, society is the population, the people. Therefore, the media (newspapers, radio, television and the Internet) are the only reliable means of the population. Because a person cannot express his appeal or opinion, or a complaint, to all the people in the society at once, only through the media, and through it a person can achieve his goal. As an autumn, the population sees the work done by it through these media and draws appropriate conclusions from it.

It is known that the role of the press, which specializes in the lives of young people, in educating young people is special. Because the press, which specializes in special youth, guides them as the main force that determines the future of society, the educator acts as a communicative vehicle [1]. Commenting on the importance of the press in this direction, V.G. Ganicheva says: «Special publications for young people should not only cover the life problems of their audience (where to study, what to specialize, what to do in their spare time), but also to participate in overcoming them, to help them find their place in society» [2]. Researcher E.G. Gnevasheva not only focuses on the features of the youth edition, but also emphasizes its audience: «In today's youth, a new view of the world has emerged. Therefore, it should be noted that the task of educating young people falls on the youth publications» [3].

According to the Karakalpak Information and Mass Communications Department, in the Republic of Karakalpakstan, there are currently 49 registered media outlets in the field of journalism, of which, only Karakalpakstan Jaslary is a special youth publication. This is the saddest part of the problem. Because in today's era of globalization, when the problem of educating young people is one of the main problems in all parts of the world, there is only one publication that encourages ad descent to unite and solve problems related to their upbringing.

Secondly, according to statistics, «approximately 40% of the total population of Uzbekistan is under 18 years old. Children under the age of 18 make up 30 percent of Uzbekistan's nearly 30 million population» [4]. If we are talking about children here, It is clear from these data that young people also make up almost the majority of the population of Uzbekistan. This figure also applies to the Republic of Karakalpakstan.

So, the fact that in the region, where young people and children form the basis of the population of the region, there is only one publication dedicated to them, means that the problem is obvious. However, the relevant officials and experts have not yet commented on this. This is the second manifestation of the problem.

The next problem is the age of the journalists working in the youth edition. Of course, in accordance with the purposeful organization and direction of any publication, it is necessary to identify all the features and aspects that are unique to it. And it is necessary to pay constant attention to these aspects. For instance, in publications dedicated to women, only men work, activities of non-legal staff in legal publications, and the activities of journalists in health care publications who do not belong to the field at all or the way adults operate in youth publication, in our view, is not at all ethical at all. This is also analyzed in detail in the book "Theoretical and practical bases of coverage of children's issues in the media of Uzbekistan" co-authored by Nargis Kasimova and Nazira Toshpulatova.

«I am in favor of working with a creative team of more young people in children's publications. The reason is that they have not yet forgotten the impeccable joys and sweet worries of childhood. Young artists are also the initiators of new ideas» [5]. That opinion was expressed by an experienced journalist from Uzbekistan A. Juraev. That is, the journalist comes to this conclusion from his own practice. Indeed, one can fully agree with this view. Because it is better that each field is carried out by its own specialist. Otherwise, we will have to face the situation we have mentioned above.

As can be seen from these analyzes, it would be good for the youth publication to pay more attention to the issue of the age of journalists in their work.

The next problem is the lack of connection between the sponsorship of the publications and the newspaper editorial office. For example, publications in the Republic of Karakalpakstan can be conditionally classified as follows:

- Republic;
- Network;
- District;
- Frequent.

The youth edition, which is our object in this article, is one of the republican editions. Because this publication is dedicated to the socio-political issues of youth in all regions of the Republic of Karakalpakstan. The publication is intended to be headed by the Council of Ministers of the Republic of Karakalpakstan and the Council of the Youth Social Movement of the Republic of Karakalpakstan. This is stated both in the registration and organization of the newspaper, and in the newspaper itself. But these things do not seem to be noticeable in the creative activity of the newspaper, nor in the activity of other material issues. That is, the founders do not pay attention to the material side of the newspaper in the first place, secondly, is that the creative journalist does not pay attention to the staff at all.

All this can be attributed to the low level of activity of the youth press in Karakalpakstan. This, in turn, affects the creative thinking of journalists working for the newspaper, secondly, the low level of creative thinking of the journalist is due to the lack of ideas to guide young people in the right direction, this shows that it can have a very negative impact on the upbringing of young people.

When we list the problems with the youth edition in Karakalpakstan, it is possible to overestimate the current state of the publication due to the many problems there. Not to mention the technique and technology, as well as the issue of regional correspondents. That is, despite all the problems, the newspaper is still operating.

Nevertheless, a number of journalistic articles and columns have been published to guide young people in the right direction. It can be seen that external authors are also participating in the newspaper with their opinions. This shows that the importance and role of the newspaper in educating young people still exists.

A number of scholars and publicists, as well as adults, discuss controversial journalistic materials and public opinion on the problems of youth education. For this purpose, the newspaper has special pages and columns, such as "Zamanlas" (contemporary), "Darman" (healing) and "Moral temasi" (moral theme). For instance, in the February 7, 2004 issue of the publication, on the page "Zamanlas" by the editorial board of "Youth Life and Problems" was published an article entitled "Everything begins with", “Assalawma aleykum” [6]. This material is about greeting etiquette and culture among young people. In there, the student and other youth expressed their views and opinions on the culture of greeting among adolescent today. At the same time, instead of summarizing the material, sociologist U.Jalmenov expresses his views on this topic in our society today. Indeed, this topic is one of the most pressing issues in our society nowadays. Especially in the current pandemic. In other words, the material covers a wide range of customs that are alien to our program and culture, such as the way young people greet each other and fight. While many of the young people who commented on the topic in the material said that the greeting was against the program, some said that they approved the program and expressed it as a level of respect for each other. However young people who oppose the program say they themselves are following the program. That is, it is clear from these thoughts of young people that it is impossible to stop or eradicate this type of greeting culture. Sociologist U. Jalmenov explains this type of greeting, which is rapidly spreading among young people: «– In my opinion, a head-to-head greeting can be a twisted type of a program of a nation, a people, a group. That being said, something bad is more sticky than something good». In addition, he strongly opposes this tradition, saying that it is difficult to say that young people who are not in line with our nationality and values, who imitate such traditions among other peoples, nations and groups, are civilized people.

This topic, raised by the editors, has aroused great interest among the public and publicists.

Publicists and the public alike have been vocal in their opposition to this type of head-to-head fighting among young people also have expressed their views on the culture of some young people to greet and ask people of all ages. Especially noteworthy is a number of journalistic materials about the youth by the scientist and publicist J.Bozorbaev. The author's comments on the subject are "Is a head-scratching also a greeting?" [7] reflected in the article entitled. The author of this article, published under the heading "Thoughts from the article", is influenced by the ideas in the article we quoted above, “It all starts with greeting (in local language it calls “Assalawma aleykum”). Commenting on the topic, the author commented on the words "Assalamu aleykum" and "Valeykum assalam" in the introduction to the article, the purpose and tasks of greeting, what is said in the Koran and Hadith about it, as well as his views on the culture of greeting in some foreign countries, and approaches them from a philosophical point of view. At the same time, the author emphasizes the influence of society in the administrative-command period on the violation of the etiquette of greeting and asking questions among young people. Regarding the situation at that time, he said: «… We kept saying “zdrastiy” (hello) without anyone noticing, otherwise we just kept quiet.. … It was even thought that the notion that one should greet one's parents in the morning was outdated». That is, the author wants to say that the influence of society on the upbringing of young people is special.

At the last part of the article, the author quotes the following lines from the poem of the late Ibragim Yusupov, the poet, hero of Uzbekistan:

«If he fights, let the rams fight head to head,
If he fights, let the roosters fight in anger».

In doing so, the author sharply criticizes the way young people shake their heads.

There are many articles in this direction in the newspaper. To do this, first of all, it is necessary to take into account the activities of the newspaper's editorial office and all the features of the journalistic staff who want to work in it.

Conclusion

All in all, the interest in the youth publication is high among the society. If the organization of the youth publication and more attention to its creative activity is strengthened, it will have an impact on the education of young people.

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