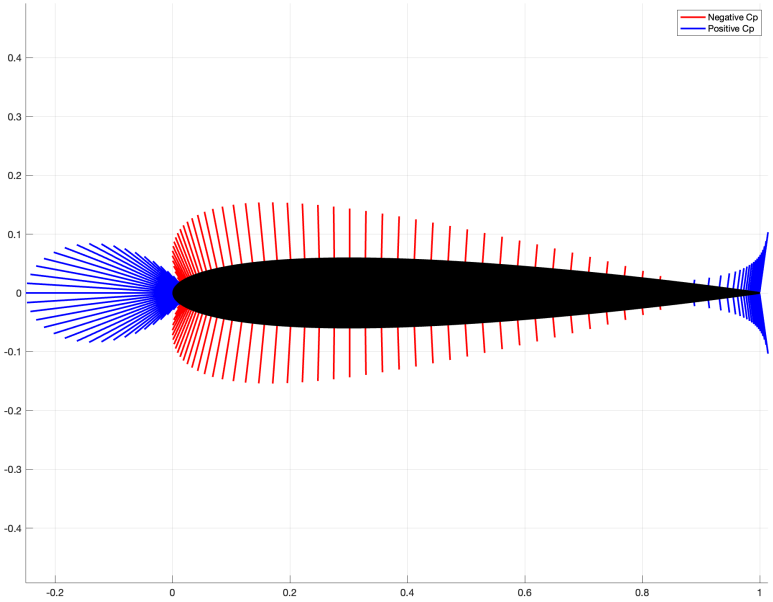
Answer
NACA 0012 is a symmetrical airfoil, due to which the short comings of spm are not visible. Thus, we may use it to analyse the flow, even though we have not explicitly satisfied the Kutta condition in this method.

SPVP may also be used, as it is a sophisticated version combining both spm and vpm and also incorporating the kutta condition while solving for the velocities.

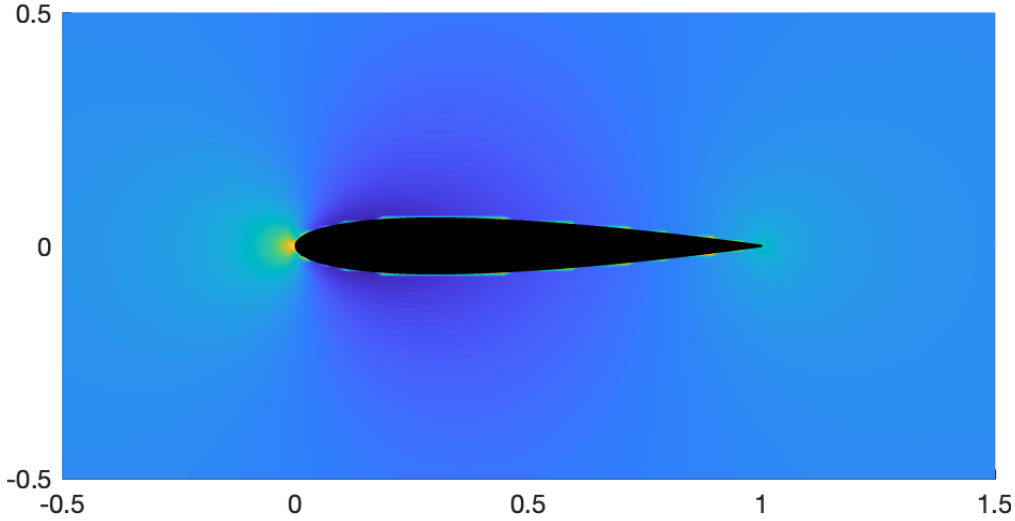
In vpm however, we see that the Cp value obtained shows deviations from the theoretical x foil open source mit data, and thus, we shall abstain from using this method for analysis.

SPM results

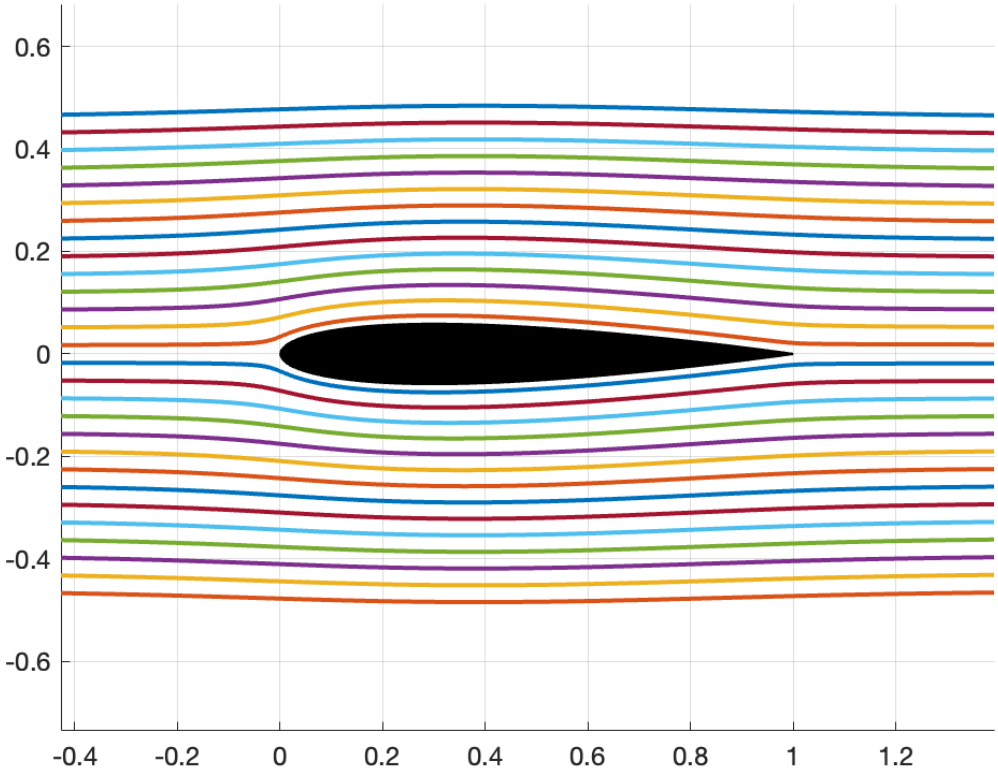
1. Cp distribution over airfoil



2. Cp contour

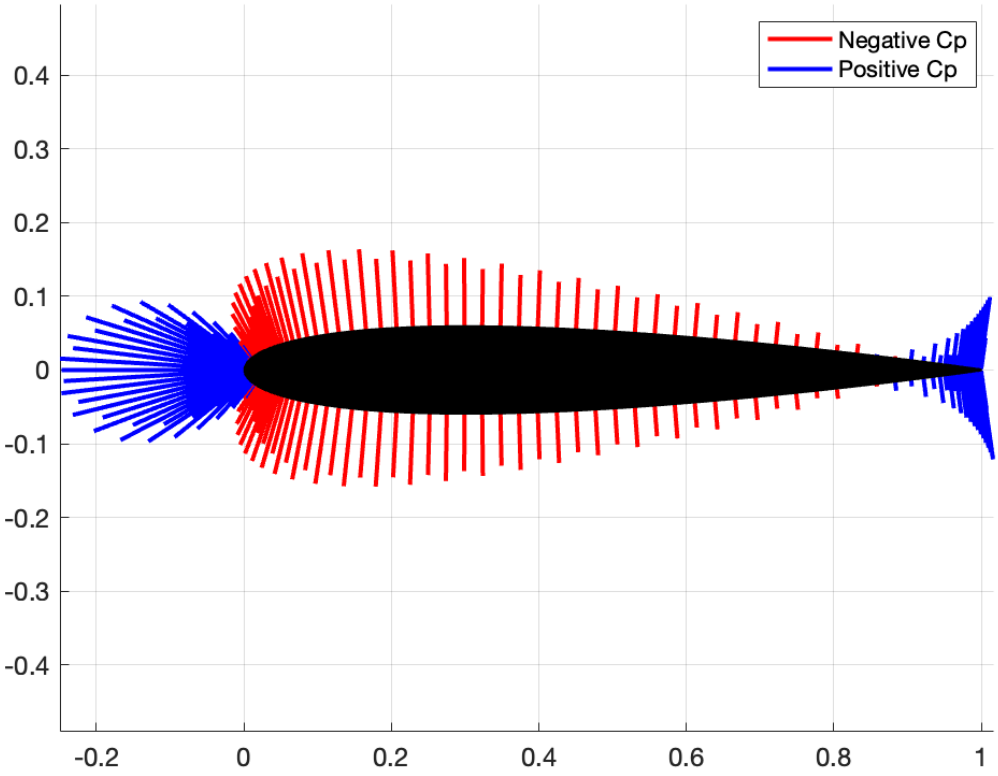


3. Streamlines

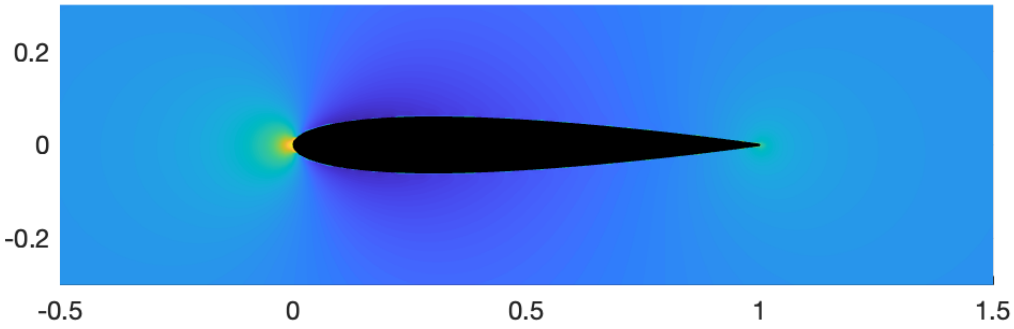


VPM results

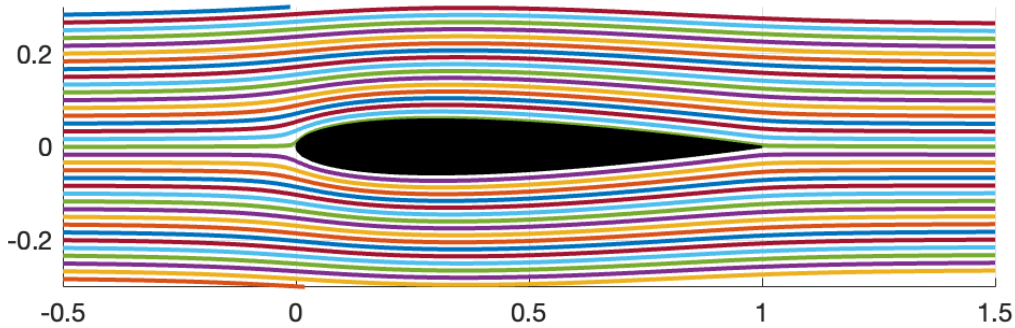
1. Cp distribution over airfoil



2. Cp contour

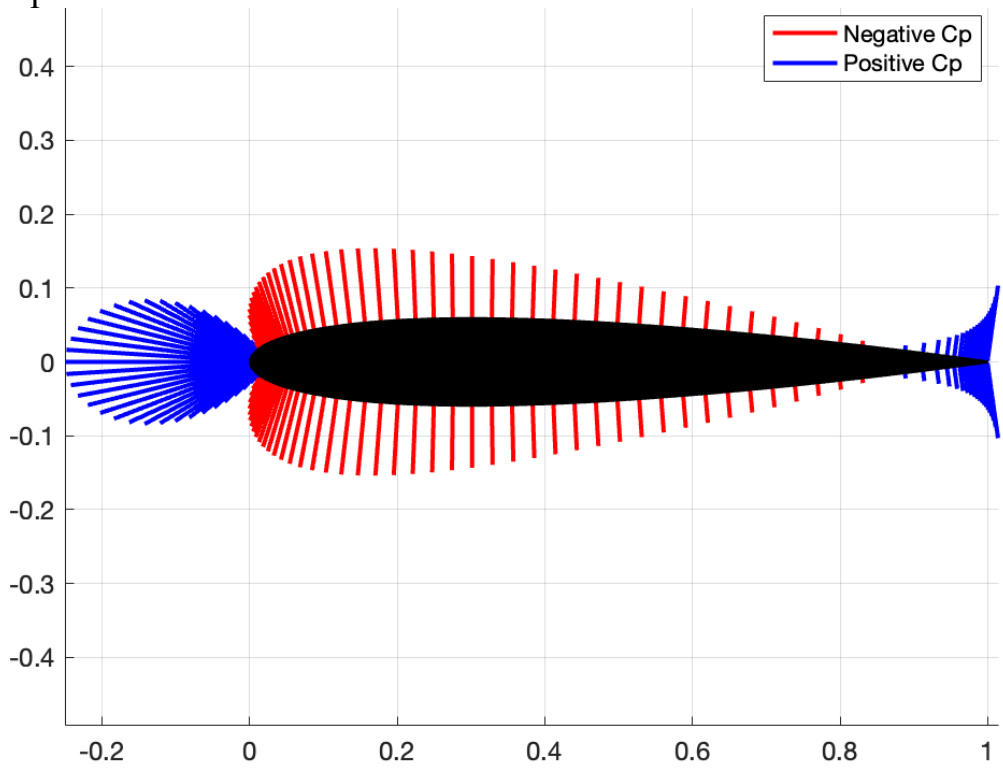


3. Streamlines

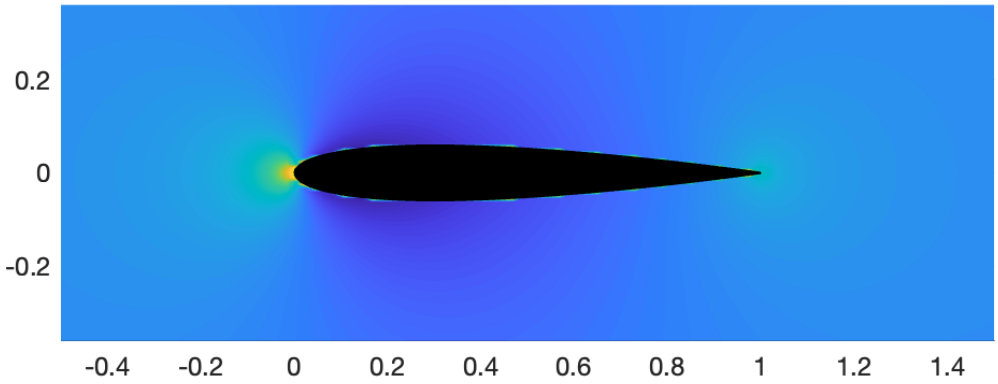


Spvp results

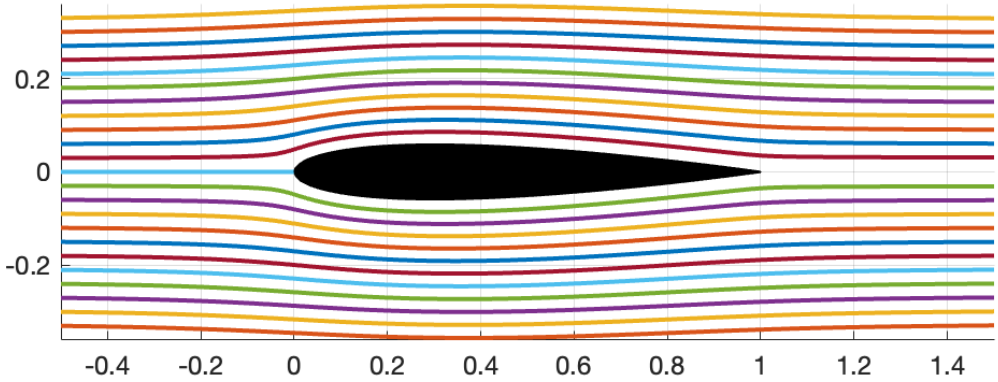
1. Cp distribution over airfoil



2. Cp contour

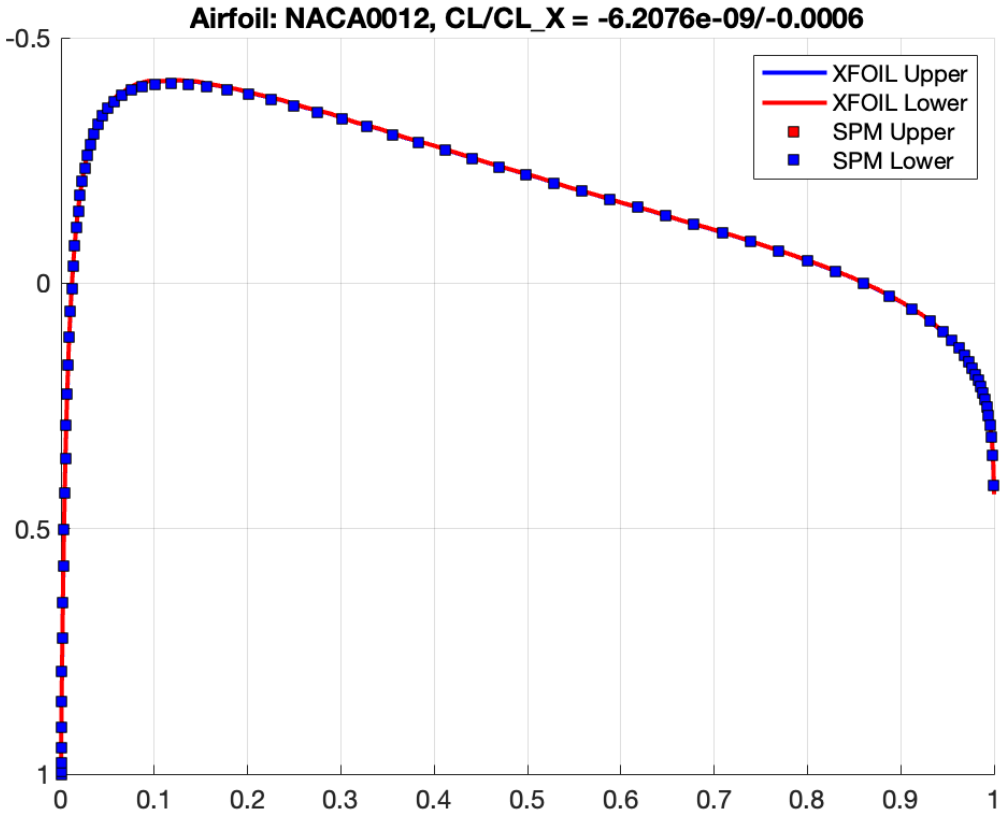


3. Streamlines

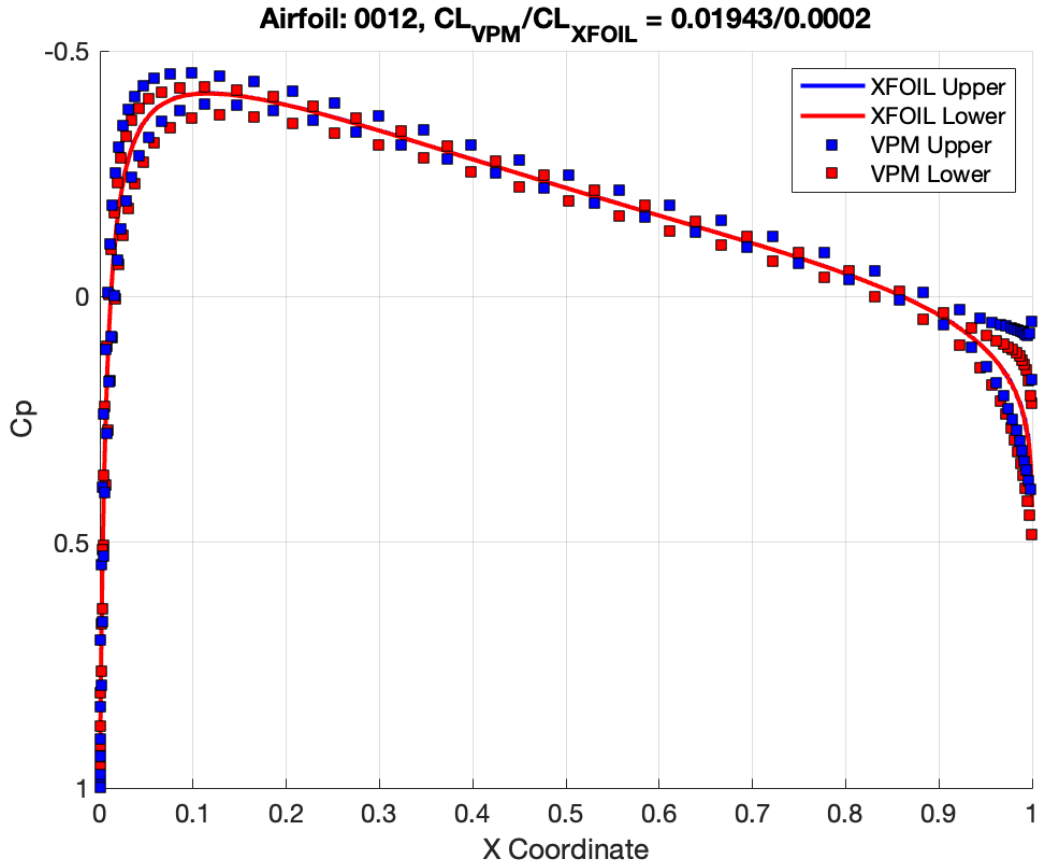


Cp vs x plots for the various methods:

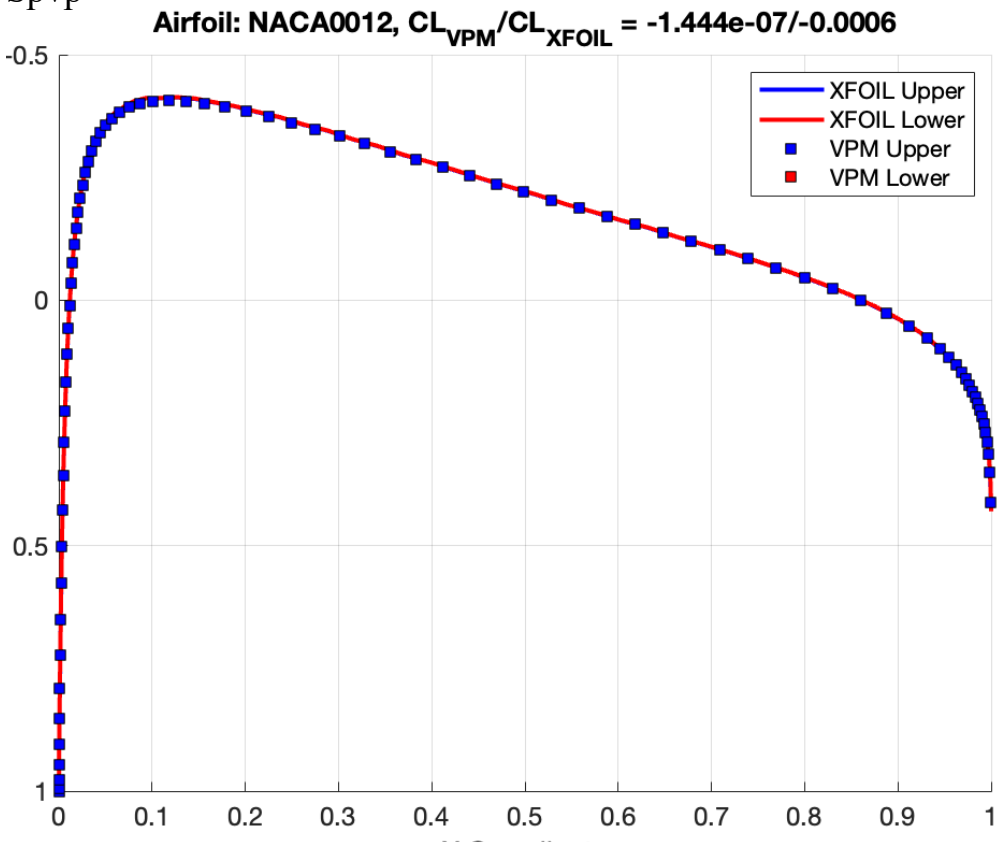
1. Spm



2. Vpm


Airfoil: 0012, CL_VPM/CL_XFOIL = 0.01943/0.0002
XFOIL Upper
XFOIL Lower
VPM Upper
VPM Lower
Cp
X Coordinate
-0.5
0
0.5
1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

3. Spvp


Airfoil: NACA0012, CL_VPM/CL_XFOIL = -1.444e-07/-0.0006
XFOIL Upper
XFOIL Lower
VPM Upper
VPM Lower
-0.5
0
0.5
1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1