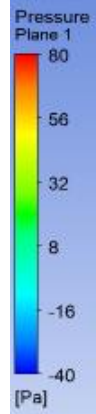


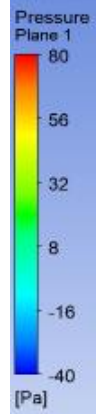
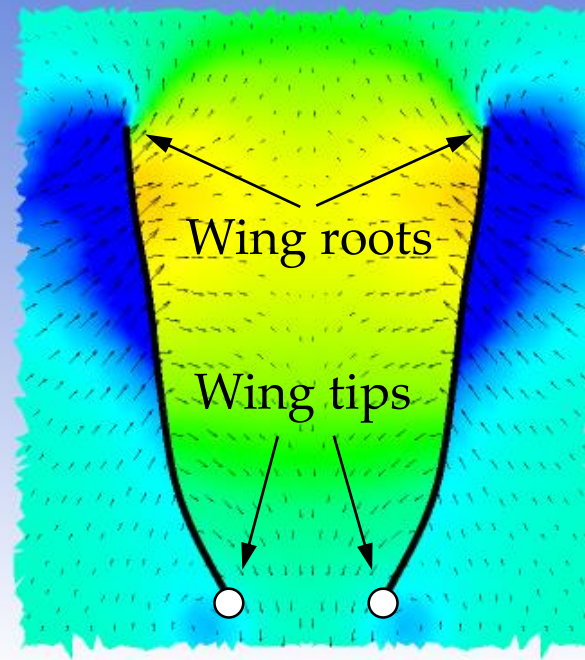
Figure S4: Flow fields in  $50\%c_m$ -plane during up-stroke reversal. For all values of  $J$ , the wing distance is 16 mm. The black curves are the intersections between the wings and the plane. The wing roots are marked with white circles.



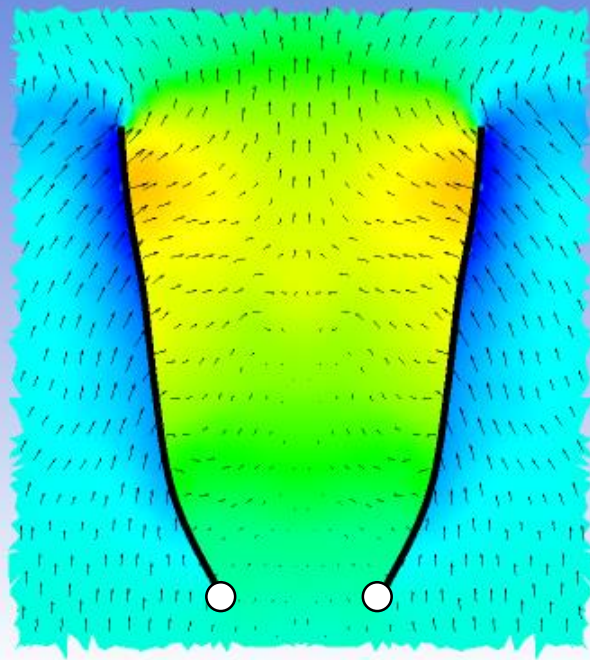
$t/T=0.73$

ANSYS  
816.2  
Acoustic

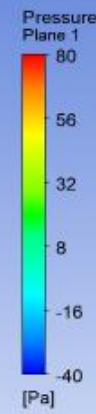
$J=0$



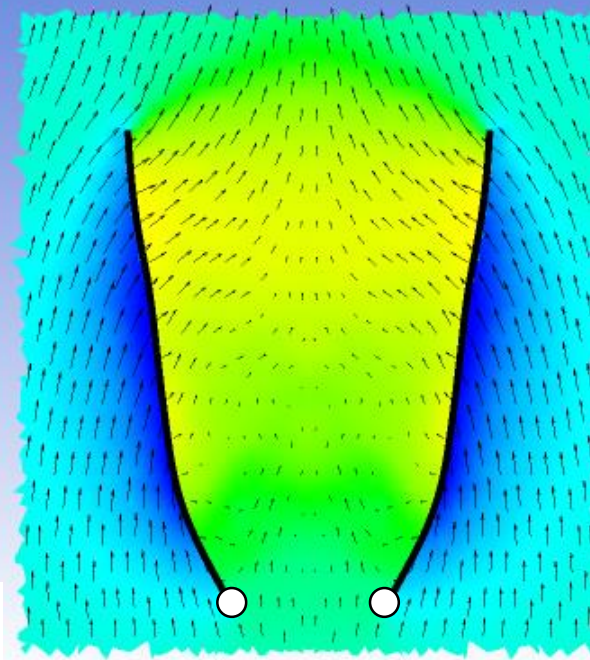
$J=0.5$



ANSYS  
816.2  
Acoustic



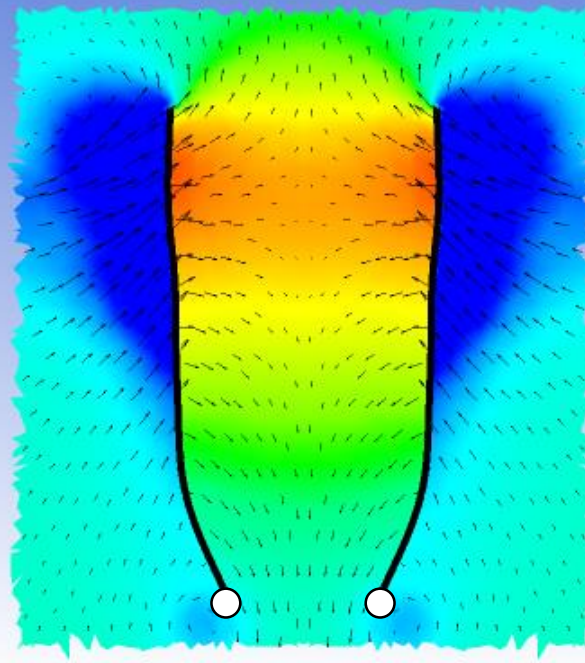
$J=1$



ANSYS  
816.2  
Acoustic

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0$

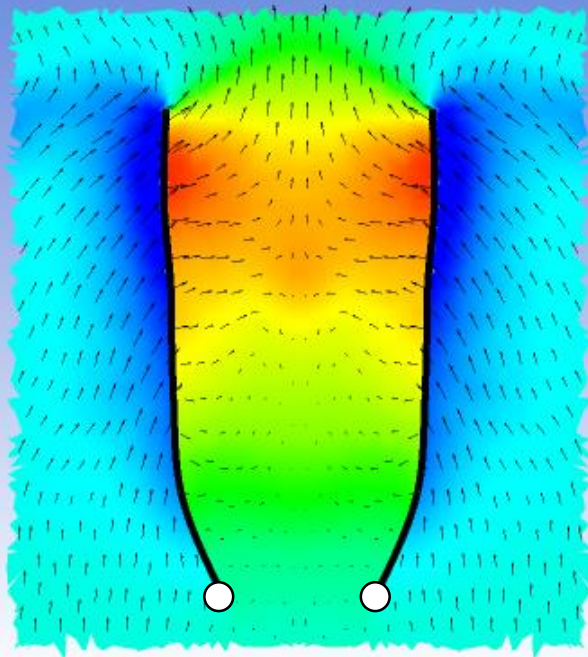


$t/T=0.74$

ANSYS  
Fluent  
Acoustic

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

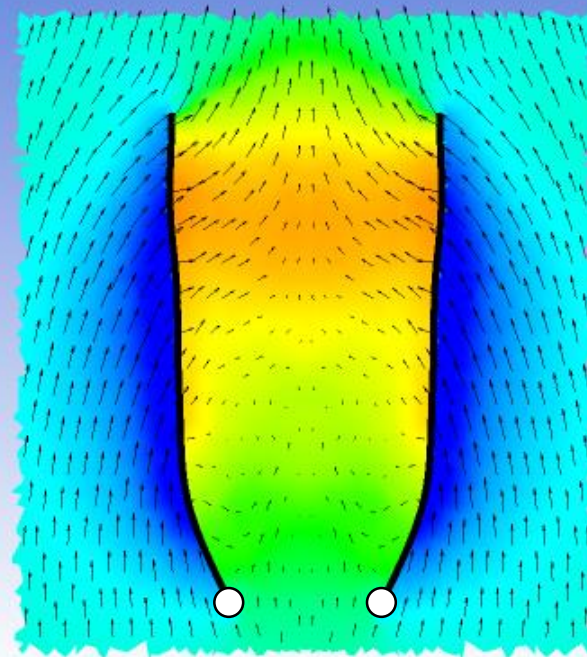
$J=0.5$



ANSYS  
Fluent  
Acoustic

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

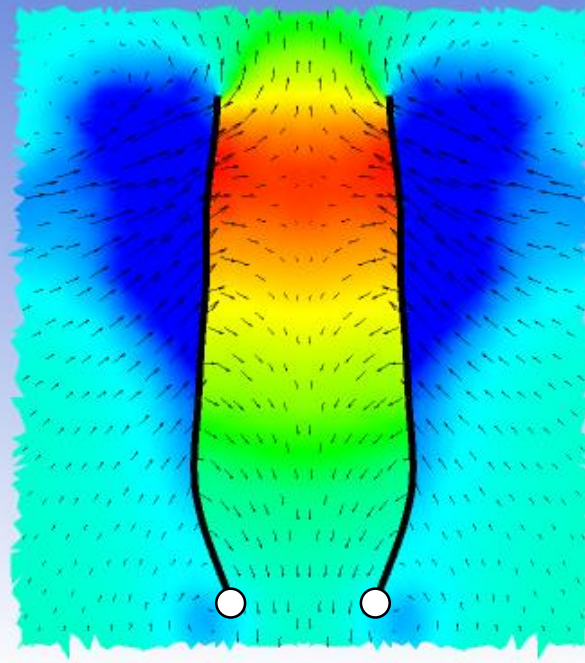
$J=1$



ANSYS  
Fluent  
Acoustic

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0$

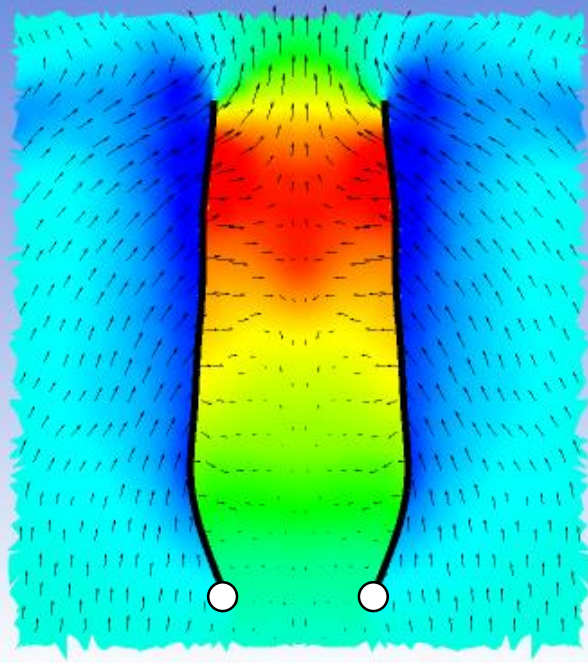


$t/T=0.75$

ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

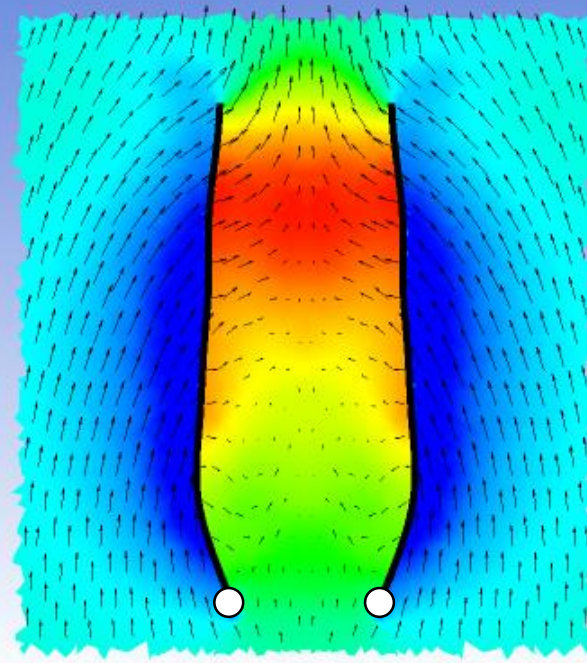
$J=0.5$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

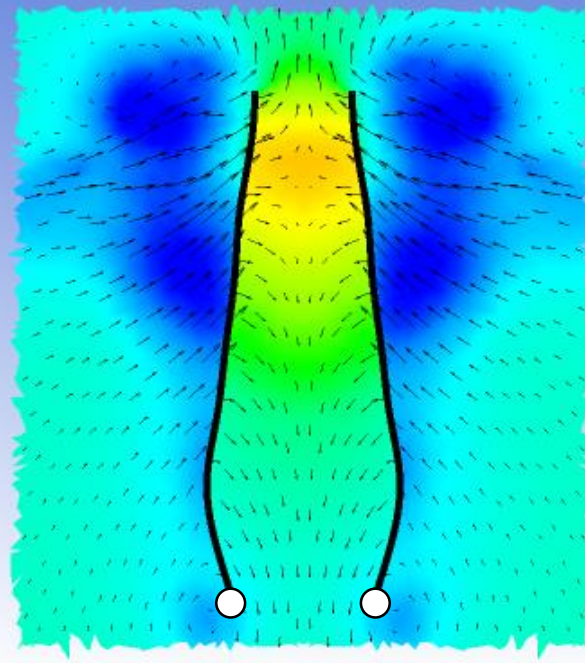
$J=1$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0$

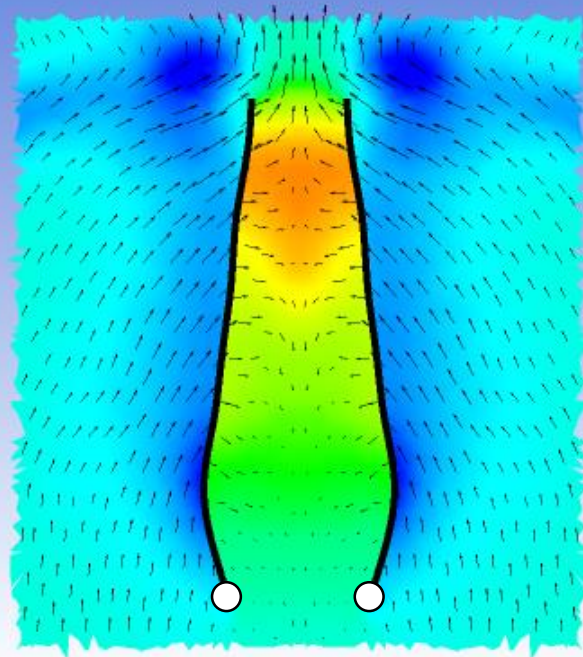


$t/T=0.76$

ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

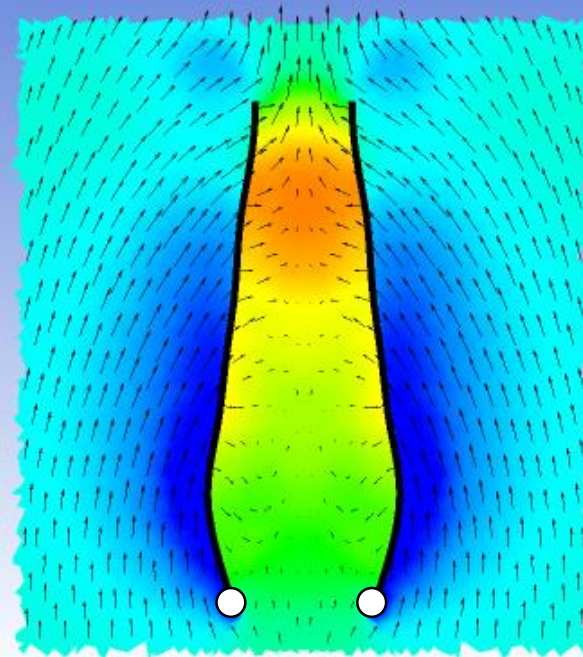
$J=0.5$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

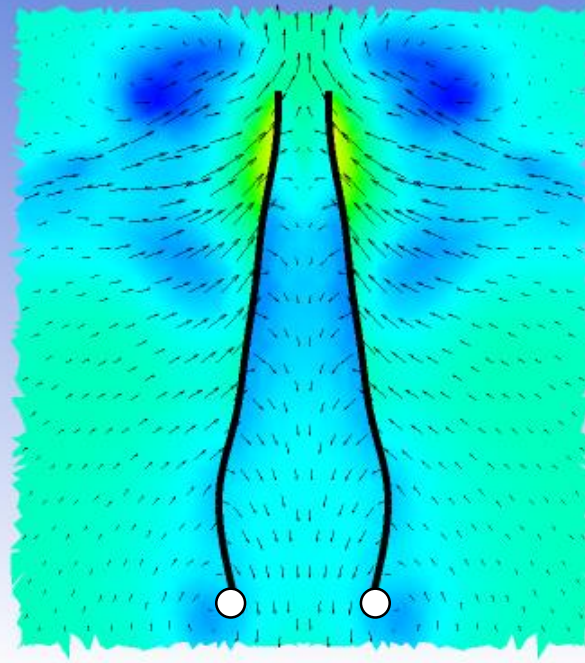
$J=1$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0$

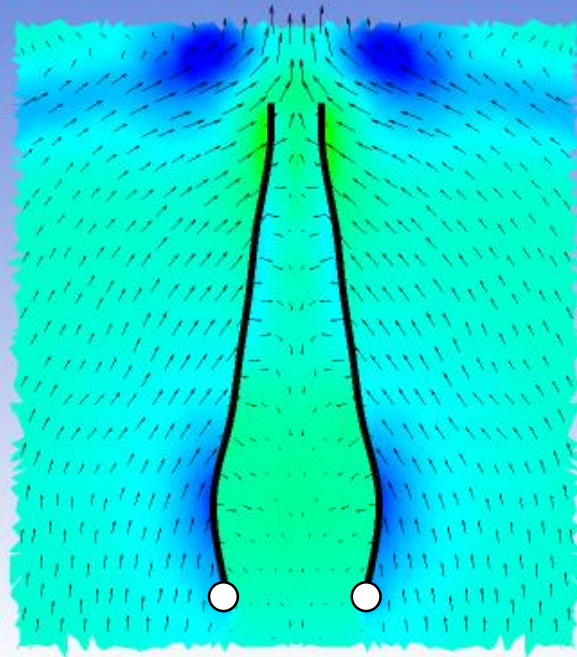


$t/T=0.77$

ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

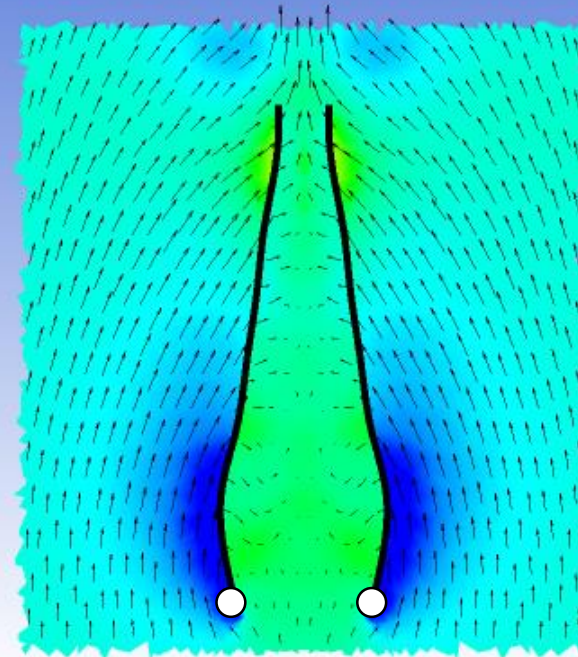
$J=0.5$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

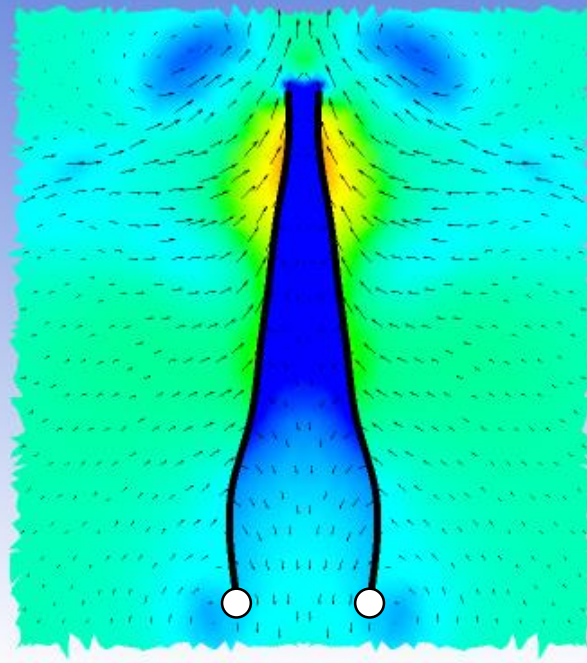
$J=1$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0$

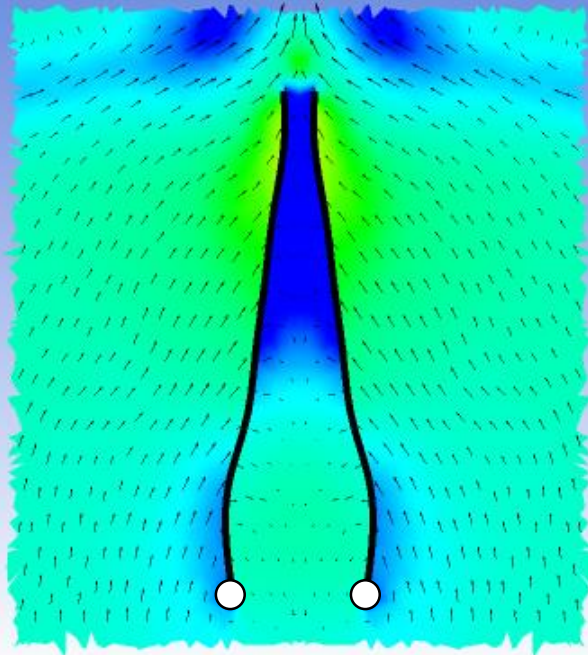


$t/T=0.78$

ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

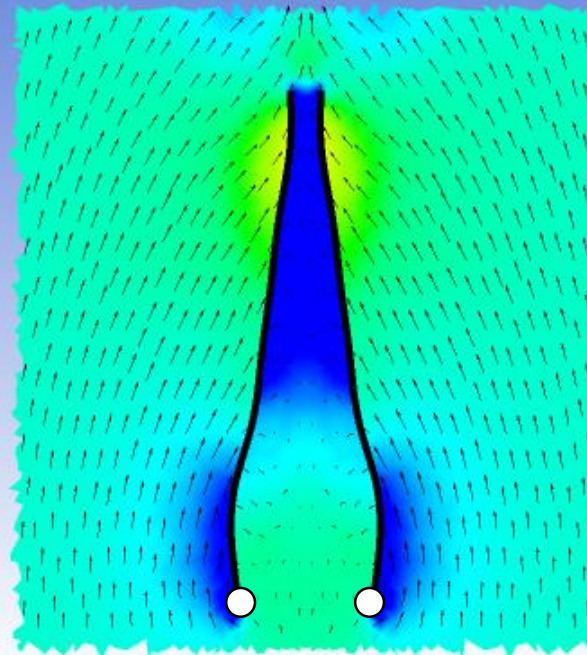
$J=0.5$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

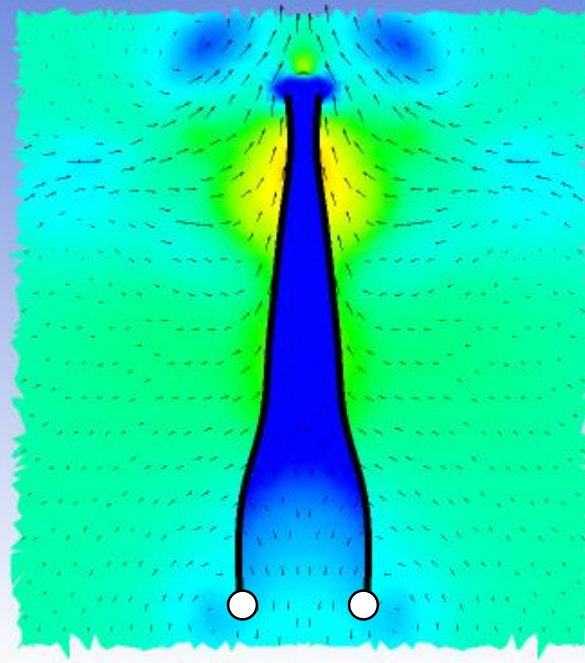
$J=1$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

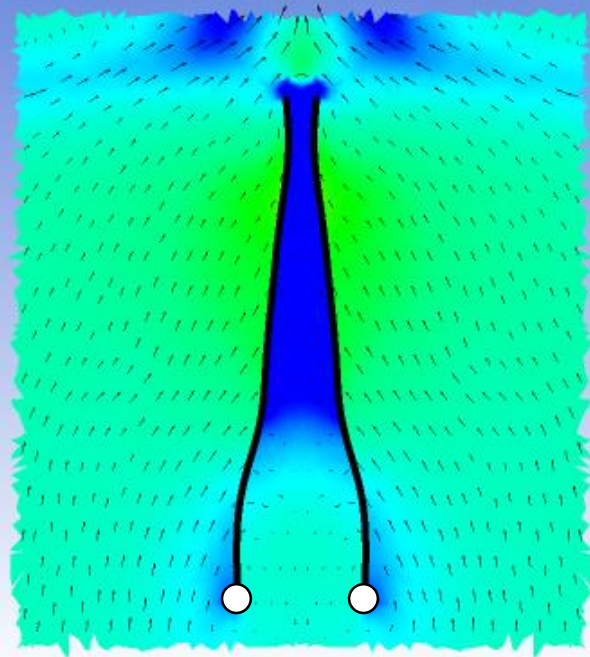
$J=0$



$t/T=0.79$

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

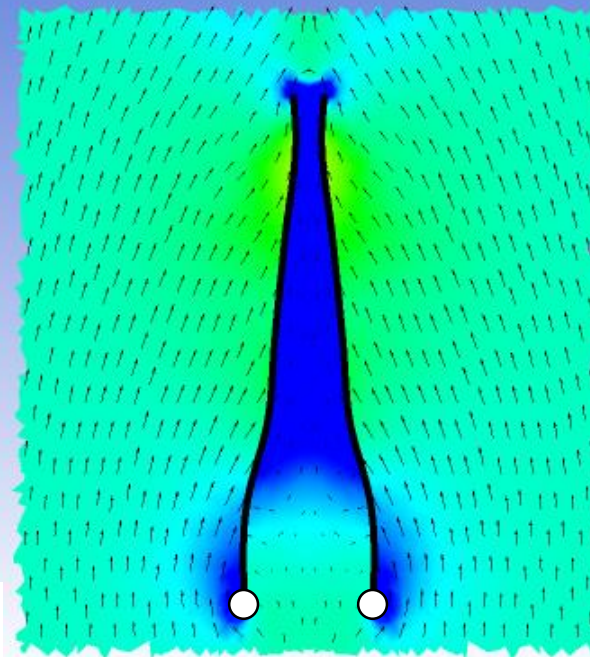
$J=0.5$



ANSYS  
R16.2  
Acoustic

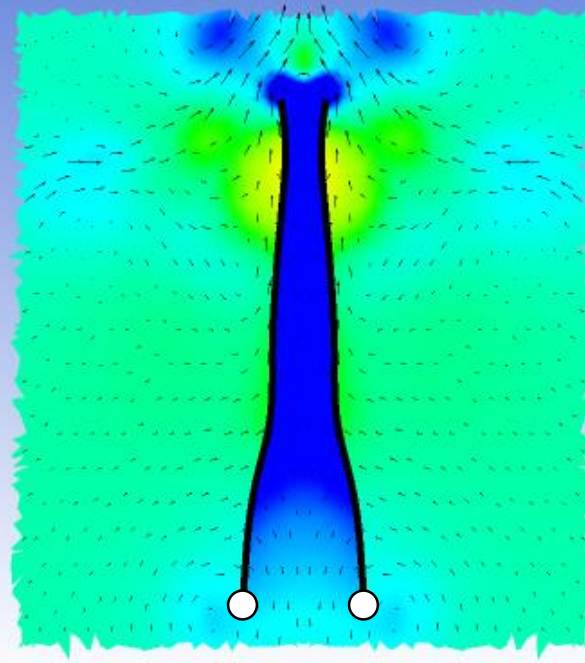
Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=1$



Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0$

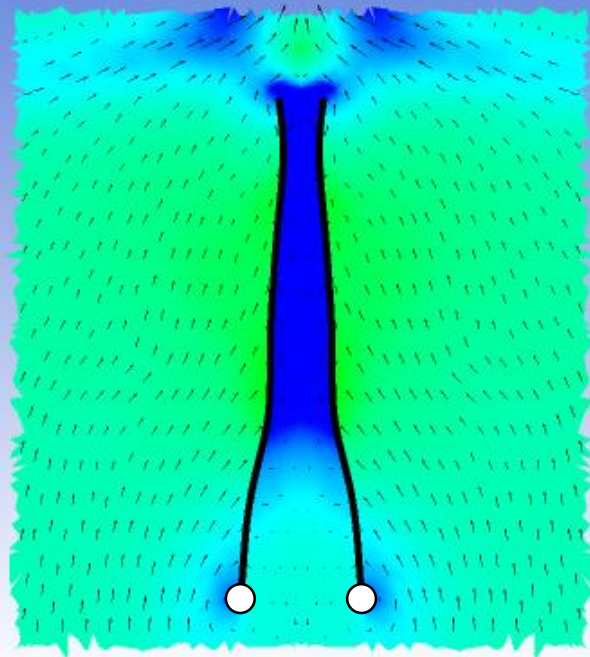


$t/T=0.80$

ANSYS  
R16.2  
Azimuthal

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

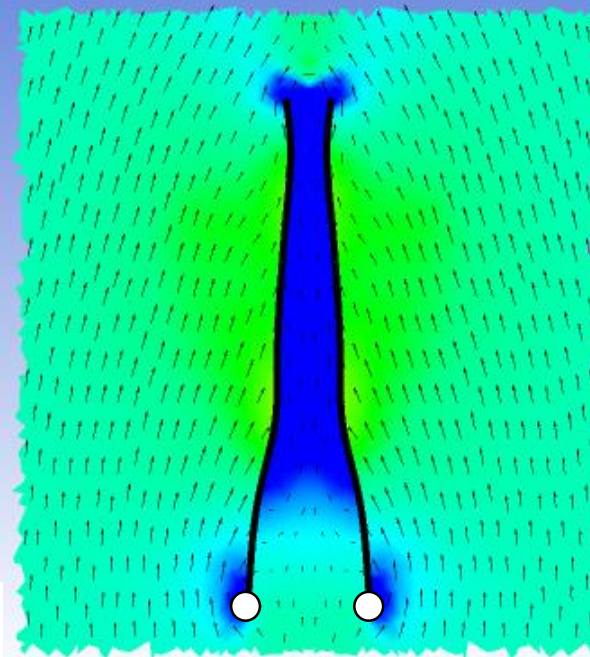
$J=0.5$



ANSYS  
R16.2  
Azimuthal

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

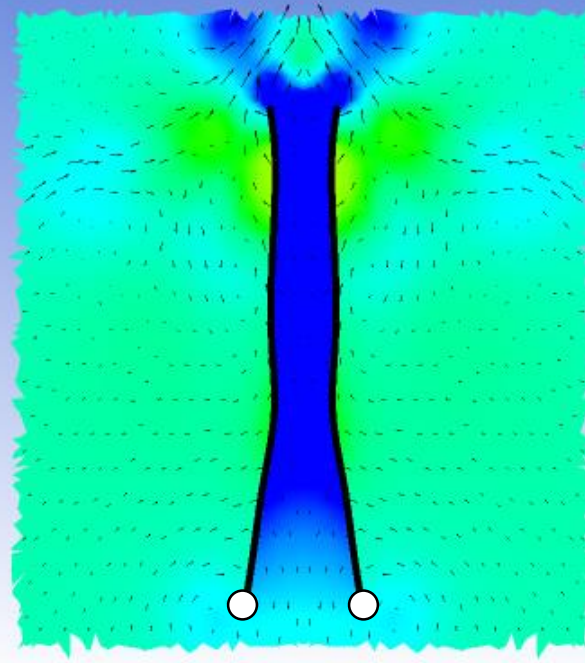
$J=1$



ANSYS  
R16.2  
Azimuthal

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0$

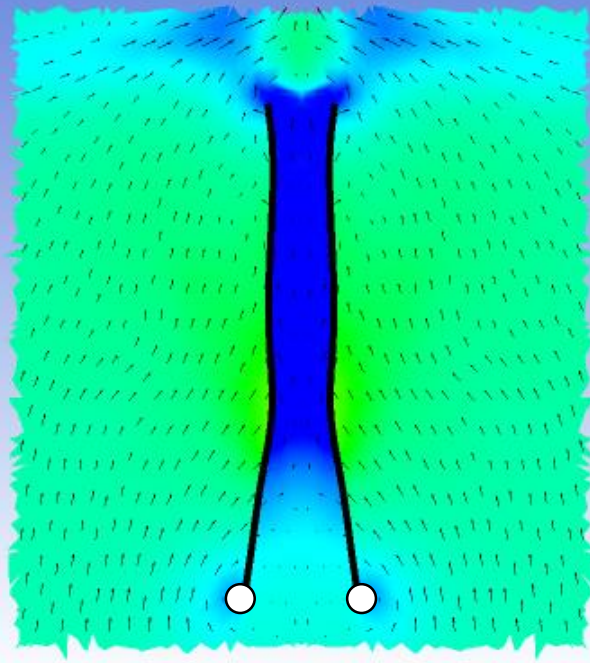


$t/T=0.81$

ANSYS  
816.2  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

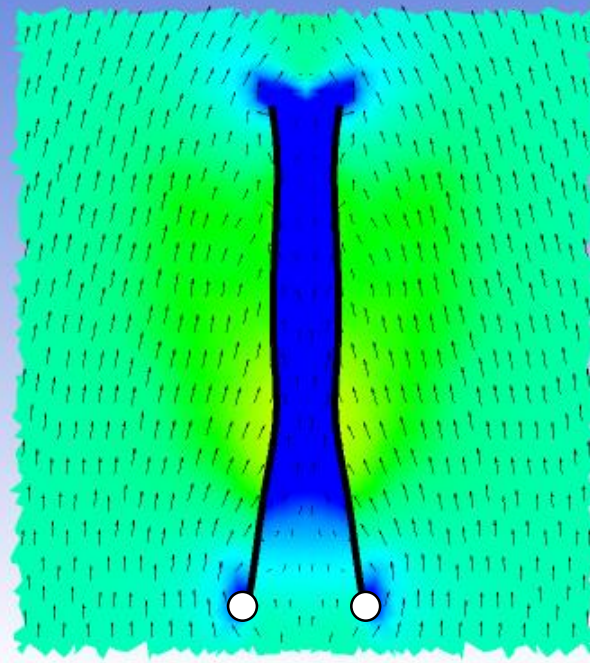
$J=0.5$



ANSYS  
816.2  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

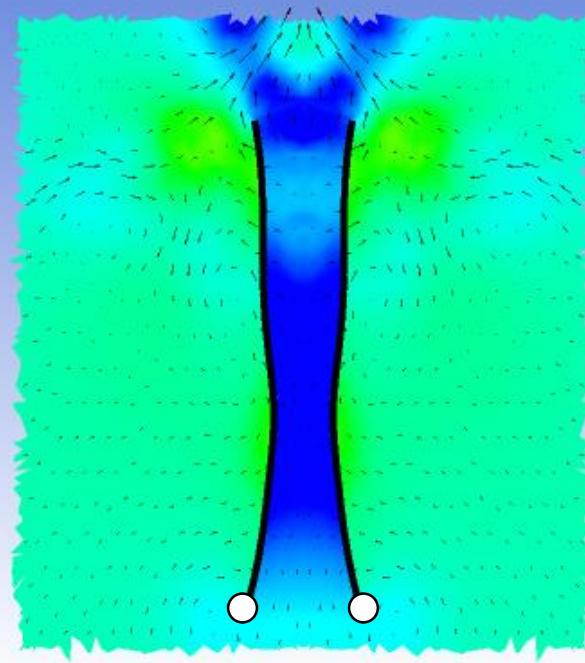
$J=1$



ANSYS  
816.2  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0$

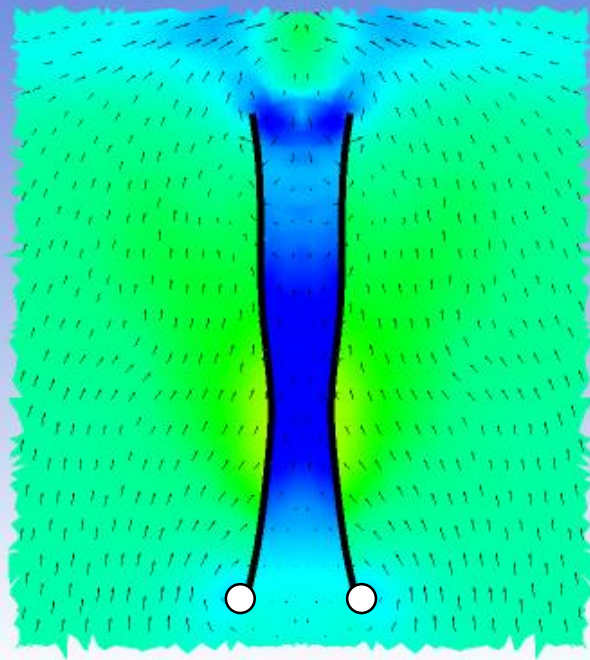


$t/T=0.82$

ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

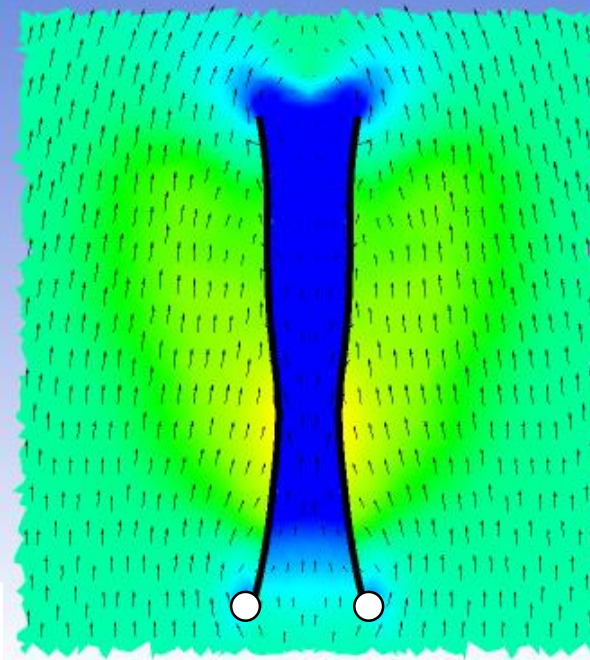
$J=0.5$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

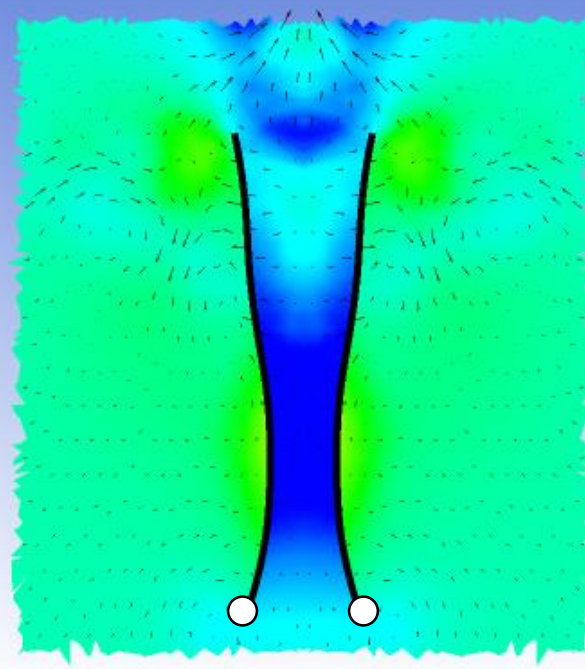
$J=1$



ANSYS  
Fluent  
Axisymmetric

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

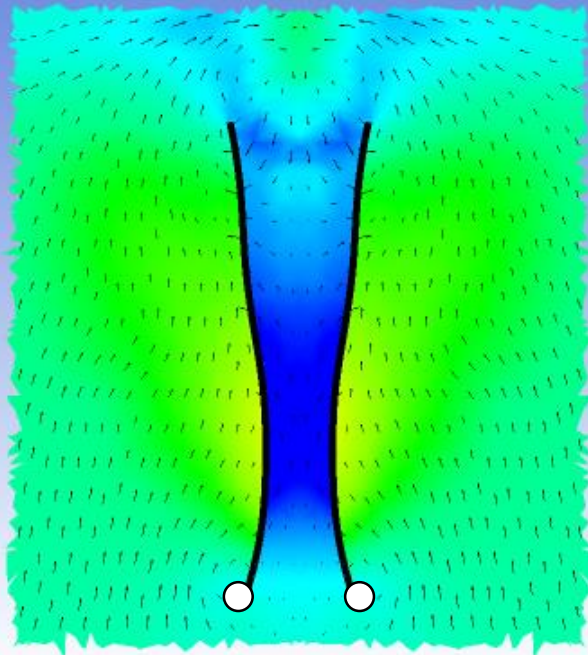
$J=0$



$t/T=0.83$

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

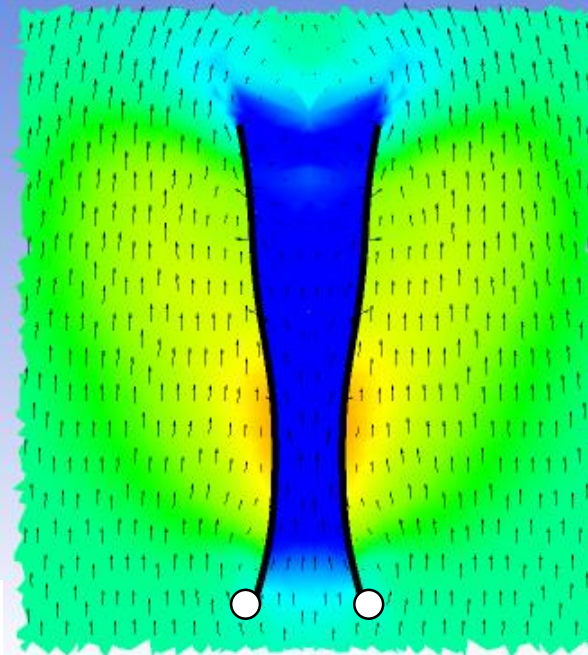
$J=0.5$



ANSYS  
816.2  
Acoustic

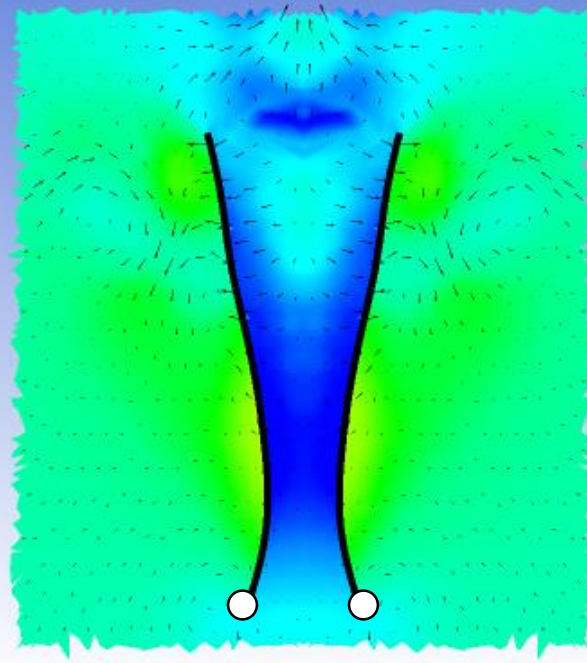
Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=1$



Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

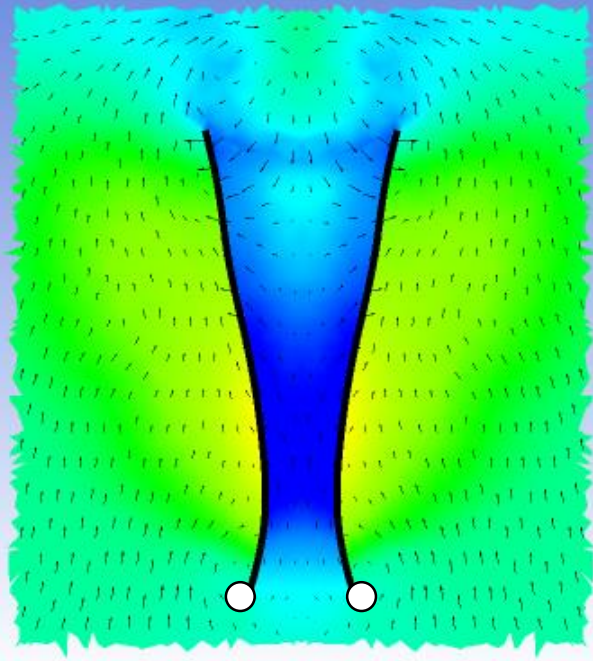
$J=0$



$t/T=0.84$

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

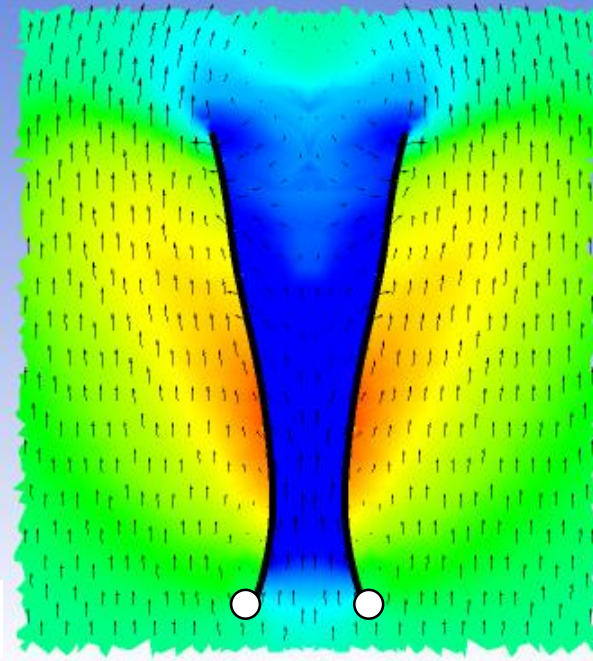
$J=0.5$



ANSYS  
R16.2  
Azimuthal

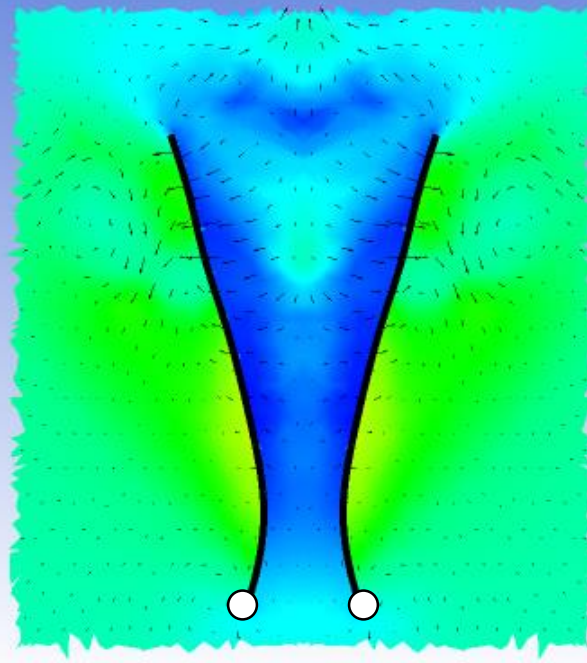
Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=1$



Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

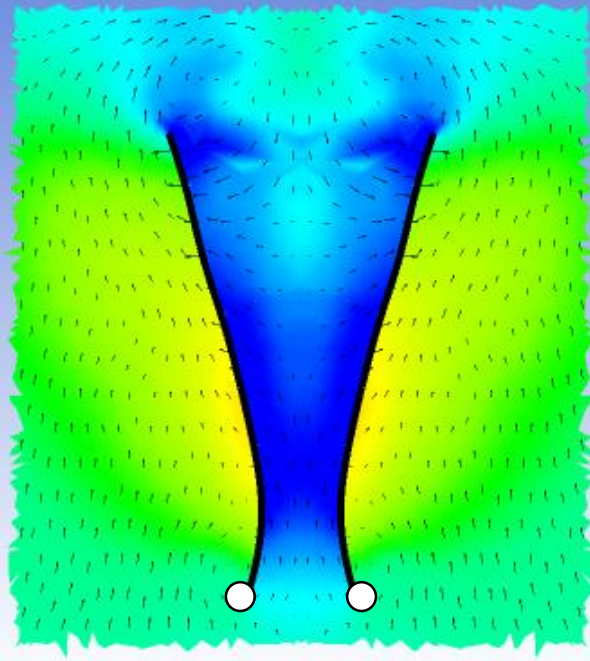
$J=0$



$t/T=0.85$

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=0.5$



ANSYS  
816.2  
Azimuthal

Pressure  
Plane 1  
80  
56  
32  
8  
-16  
-40  
[Pa]

$J=1$

