

57:020 FLUIDS 2008FALL EFD LAB3

## E-PIV DATA POST-PROCESSING INSTRUCTIONS

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## 1. EPIV OUTPUT DATA FILE

- 1) Velocity magnitude file: 'session.zip\millimeter\_units\velocity\_mag.txt'
- 2) Velocity vector file: 'session.zip\millimeter\_units\velocity\_vec.txt'

## 2. CONVERTING EPIV DATA FILE TO TECPLOT INPUT FILE

Add following two lines to the beginning of the data files

1) velocity\_mag.txt

```
variables = x, y, u  
zone i = 63, j = 47
```

2) velocity\_vec.txt

```
variables = x, y, u, v  
zone i = 63, j = 47
```

Note that the indices 'i' and 'j' are the numbers of vectors in x- and y-direction, respectively. Ask EFD lab TA's to provide those numbers if you are not sure.

Save those files as '.dat' files for example, 'velocity\_mag.dat' and 'velocity\_vec.dat'.

'velocity\_mag.dat'

```
variables=x, y, u  
zone i = 63, j = 47  
0.526316 0.643275 0  
1.11111 0.643275 0  
1.69591 0.643275 0  
2.2807 0.643275 0  
2.8655 0.643275 0  
3.4503 0.643275 0  
4.03509 0.643275 0  
4.61988 0.643275 0  
5.20468 0.643275 0  
5.78947 0.643275 0  
6.37427 0.643275 0  
6.95906 0.643275 0  
7.54386 0.643275 0  
8.12865 0.643275 0  
8.71345 0.643275 0  
9.29825 0.643275 0  
9.88304 0.643275 0  
10.4678 0.643275 0
```

'velocity\_vec.dat'

```
variables=x, y, u, v  
zone i = 63, j = 47  
0.526316 0.643275 0 0  
1.11111 0.643275 0 0  
1.69591 0.643275 0 0  
2.2807 0.643275 0 0  
2.8655 0.643275 0 0  
3.4503 0.643275 0 0  
4.03509 0.643275 0 0  
4.61988 0.643275 0 0  
5.20468 0.643275 0 0  
5.78947 0.643275 0 0  
6.37427 0.643275 0 0  
6.95906 0.643275 0 0  
7.54386 0.643275 0 0  
8.12865 0.643275 0 0  
8.71345 0.643275 0 0  
9.29825 0.643275 0 0  
9.88304 0.643275 0 0  
10.4678 0.643275 0 0
```

### 3. EPIV DATA POSTPROCESSING BY USING TECPLOT MACRO FILES

Copy following files to your working folder:

1) ePIV data files:

- 'velocity\_mag.dat'
- 'velocity\_vec.dat'

2) Tecplot macro files:

- 'velocity\_magnitude.mcr'
- 'velocity\_vector.mcr'

3) Clark-Y geometry file:

- 'Clark-Y.dat'

#### 3.1 VELOCITY MAGNITUDE CONTOUR PLOT

Double click and open 'velocity\_magnitude.mcr'

Answer to following three prompts:

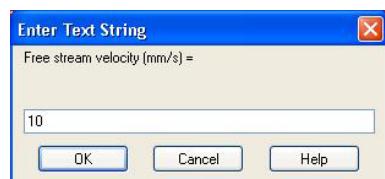
1) Type in velocity magnitude data file name (ex: velocity\_mag)



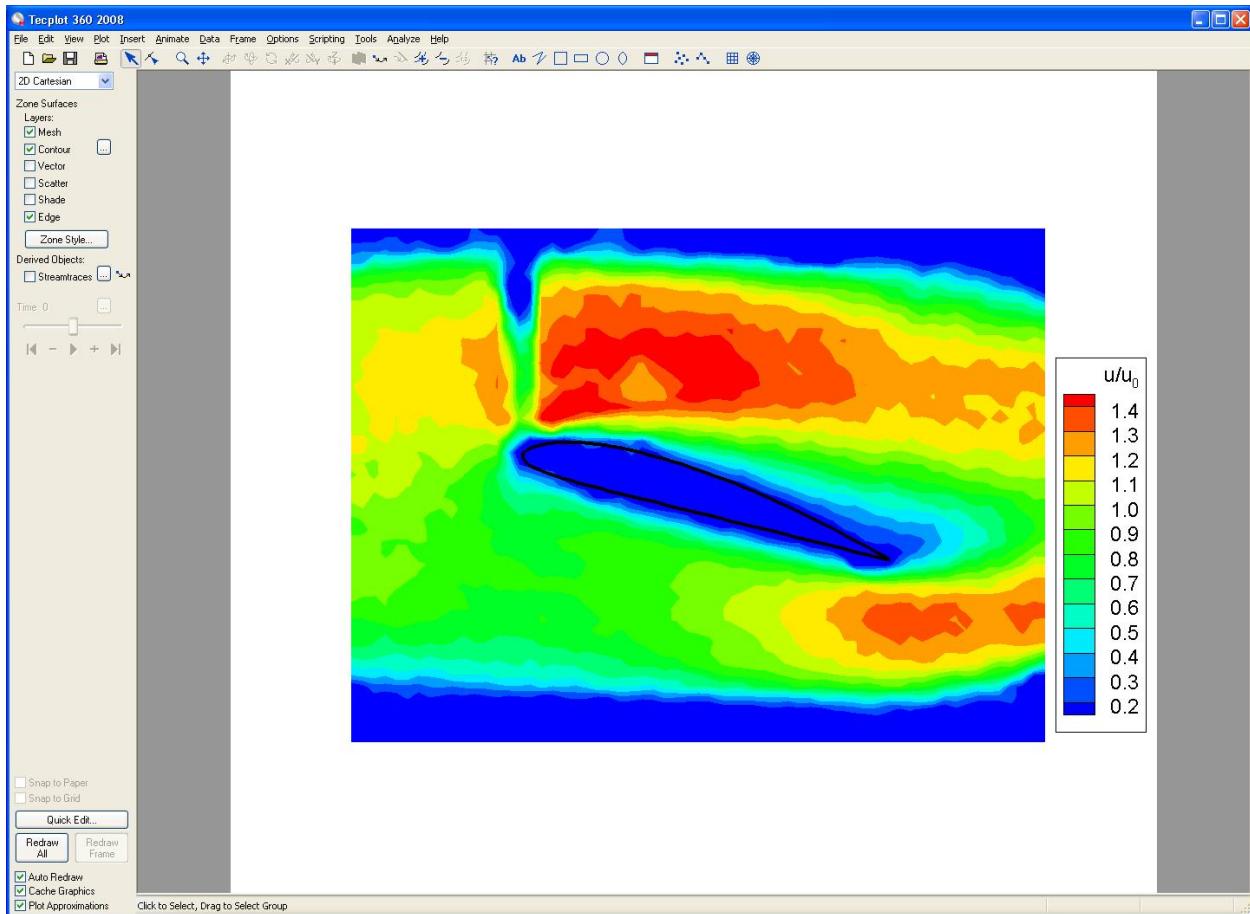
2) Select angle of attack: type in '1' for 0° and '2' for 16°



3) Input free-stream velocity (mm/s)



## Typical example of output



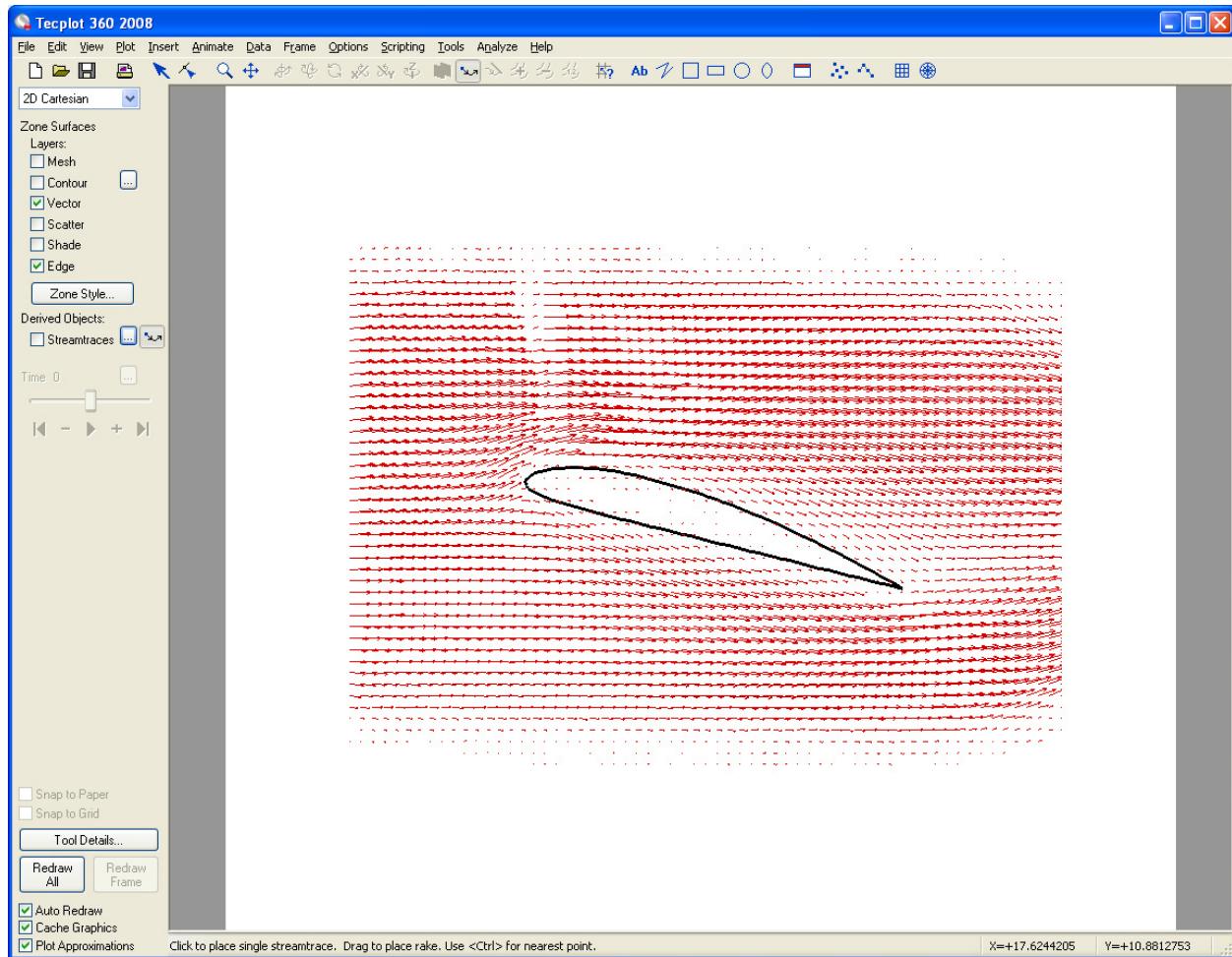
Export the figure file and save the layout file. See sections 4 and 5, respectively.

### 3.2 VELOCITY VECTOR PLOT

Double click and open 'velocity\_vector.mcr'

Repeat the process 1) and 2) of section 3.1

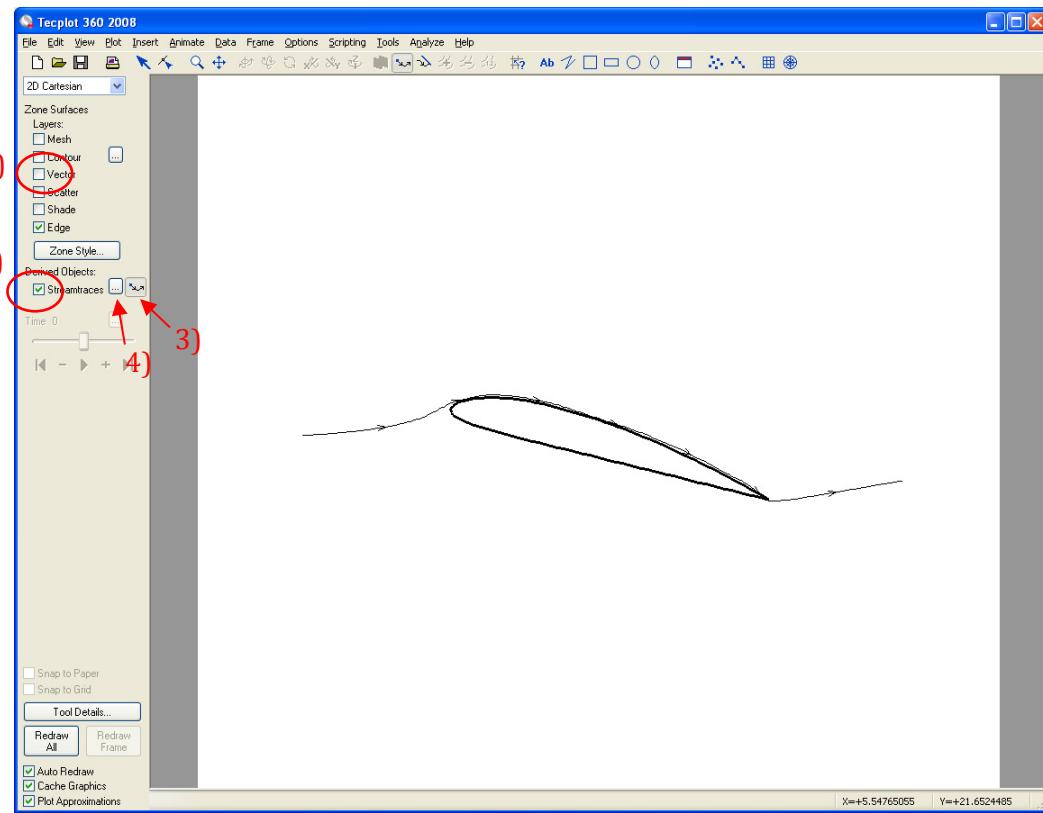
Typical example of output



Export the figure file and save the layout file. See sections 4 and 5, respectively.

Do not close the Tecplot window and continue to next section for streamlines plot

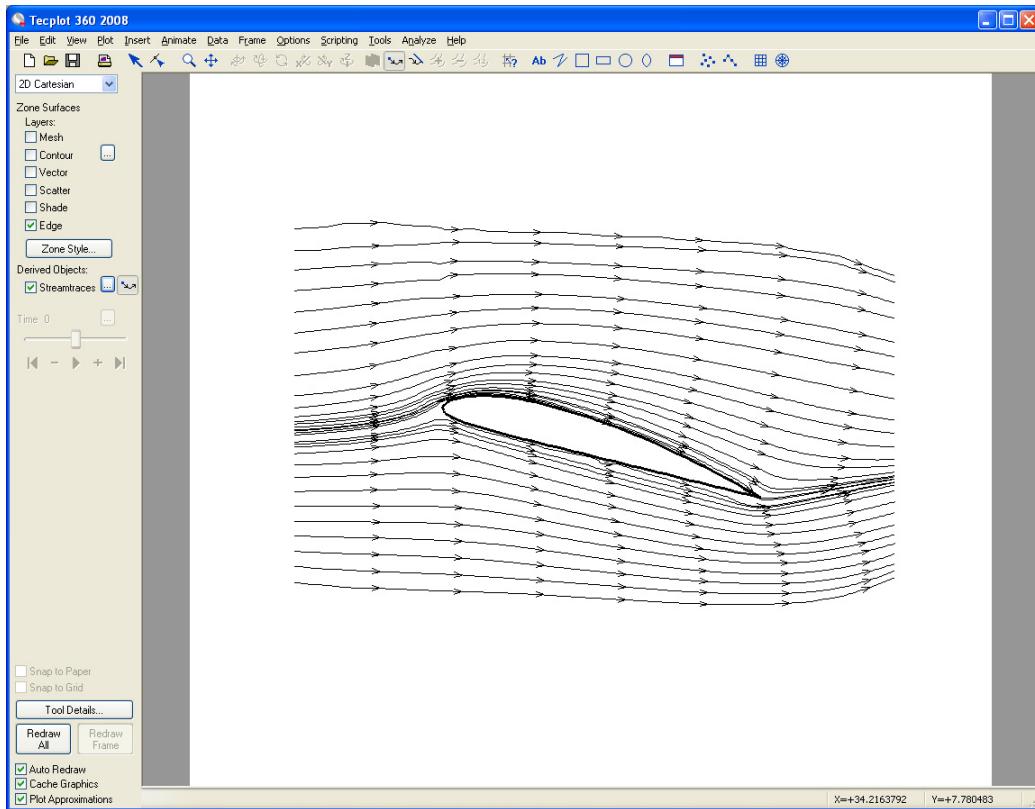
### 3.3 STREAMLINE PLOT



- 1) Turn off the 'Vector' check box
- 2) Turn on the 'Streamtraces' check box
- 3) Click the button to add a single or rake of streamlines
- 4) Click the button to edit streamlines if necessary

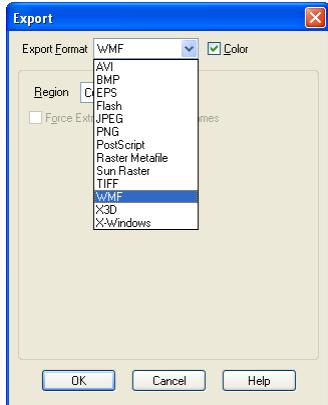
Export the figure file and save the layout file. See sections 4 and 5, respectively.

## Typical example of streamline figure

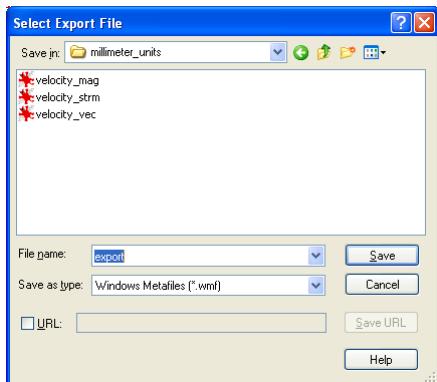


## 4. EXPORTING FIGURE FILES

Open image export window from the top menu, File\Export\



Choose image file type and type in figure file name (ex: 'streamline\_16deg.wmf')



## 5. SAVING TECPLOT LAYOUT FILES

Open Tecplot layout file save window from the top menu under 'File\Save Layout\' or 'File\Save Layout as...' and type in layout file name (ex: 'streamline\_16deg.lay')

