57:020 FLUIDS 2008FALL EFD LAB3

E-PIV DATA POST-PROCESSING INSTRUCTIONS

TABLE OF CONTENTS

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

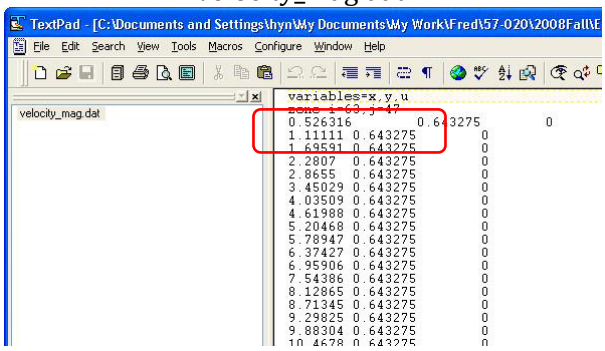
2) velocity_vec.txt

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

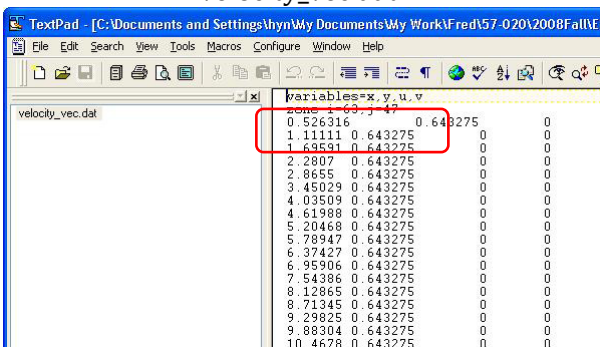
Note that the indices 'i' and 'j' are the numbers of vectors in x- and y-direction, respectively. Ask EFD lab TA's to provide those numbers if you are not sure.

Save those files as '.dat' files for example, 'velocity_mag.dat' and 'velocity_vec.dat'.

'velocity_mag.dat'



'velocity_vec.dat'



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:

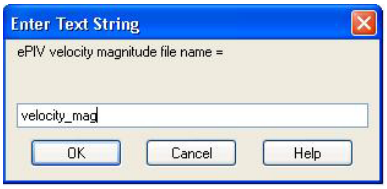
- 'Clark-Y.dat'

3.1 Velocity magnitude contour plot

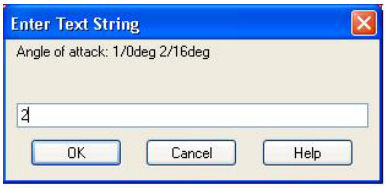
Double click and open 'velocity_magnitude.mcr'

Answer to following three prompts:

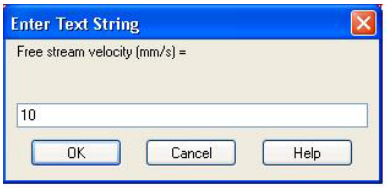
1) Type in velocity magnitude data file name (ex: velocity_mag)



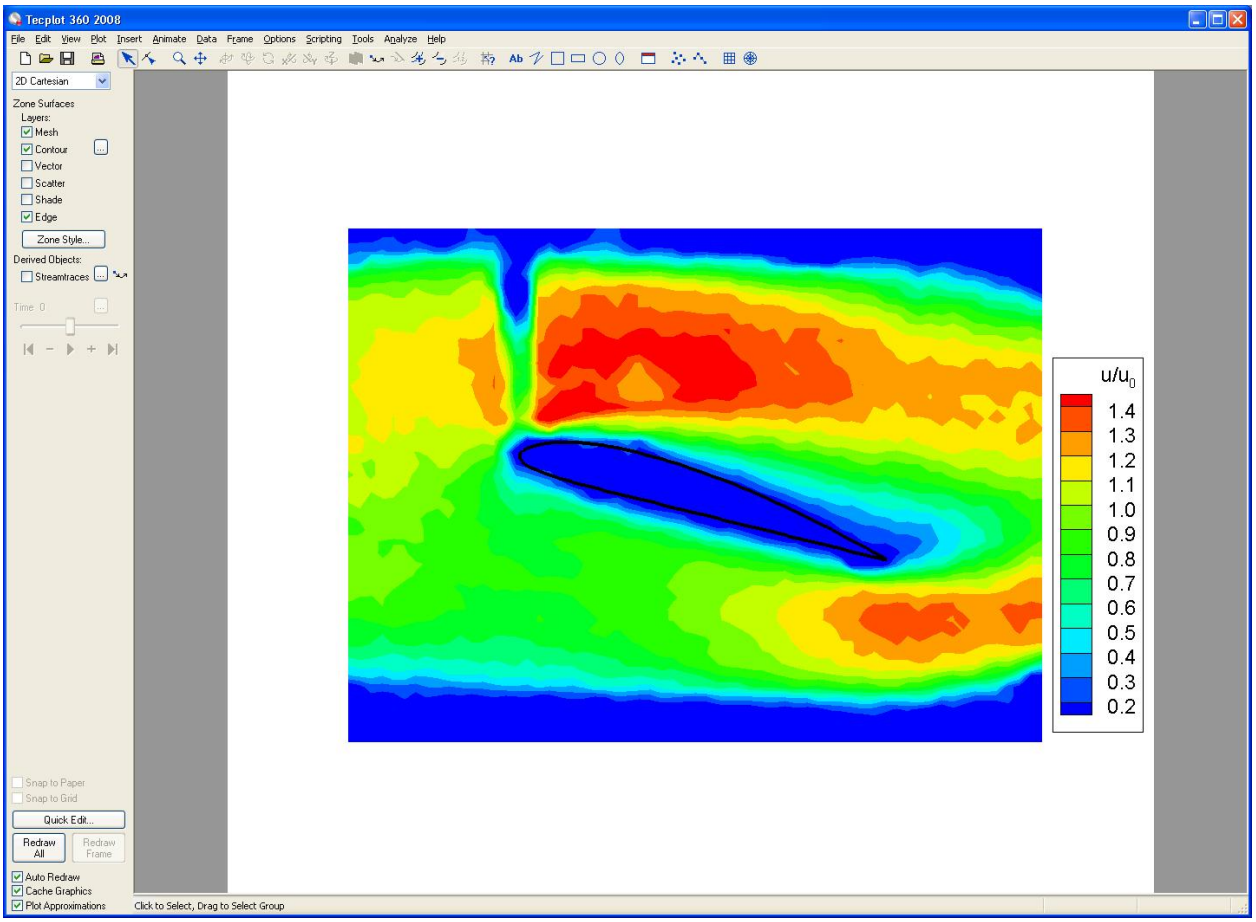
2) Select angle of attack: type in '1' for 0° and '2' for 16°



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



Typical example of output



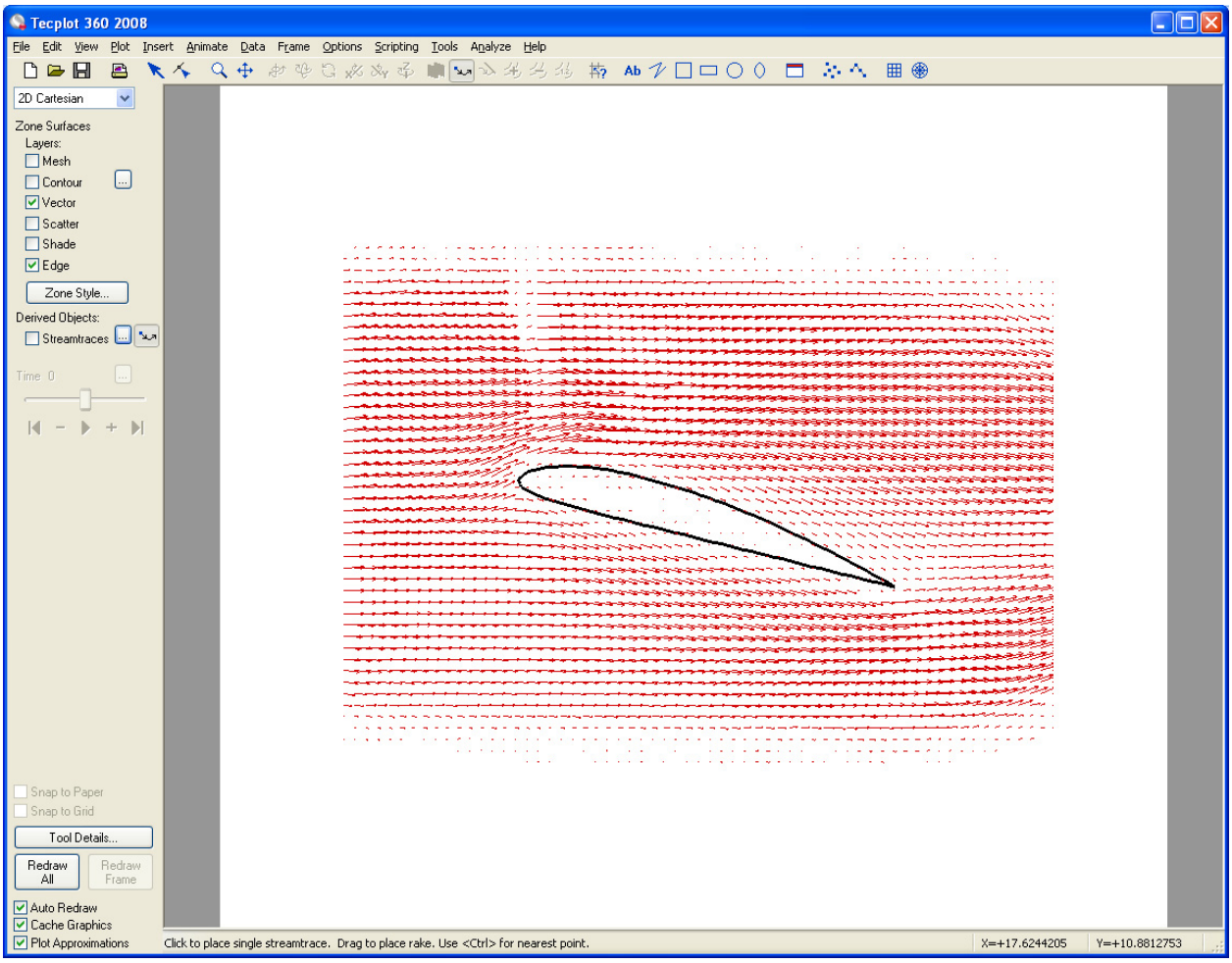
Export the figure file and save the layout file. See sections 4 and 5, respectively.

3.2 VELOCITY VECTOR PLOT

Double click and open 'velocity_vector.mcr'

Repeat the process 1) and 2) of section 3.1

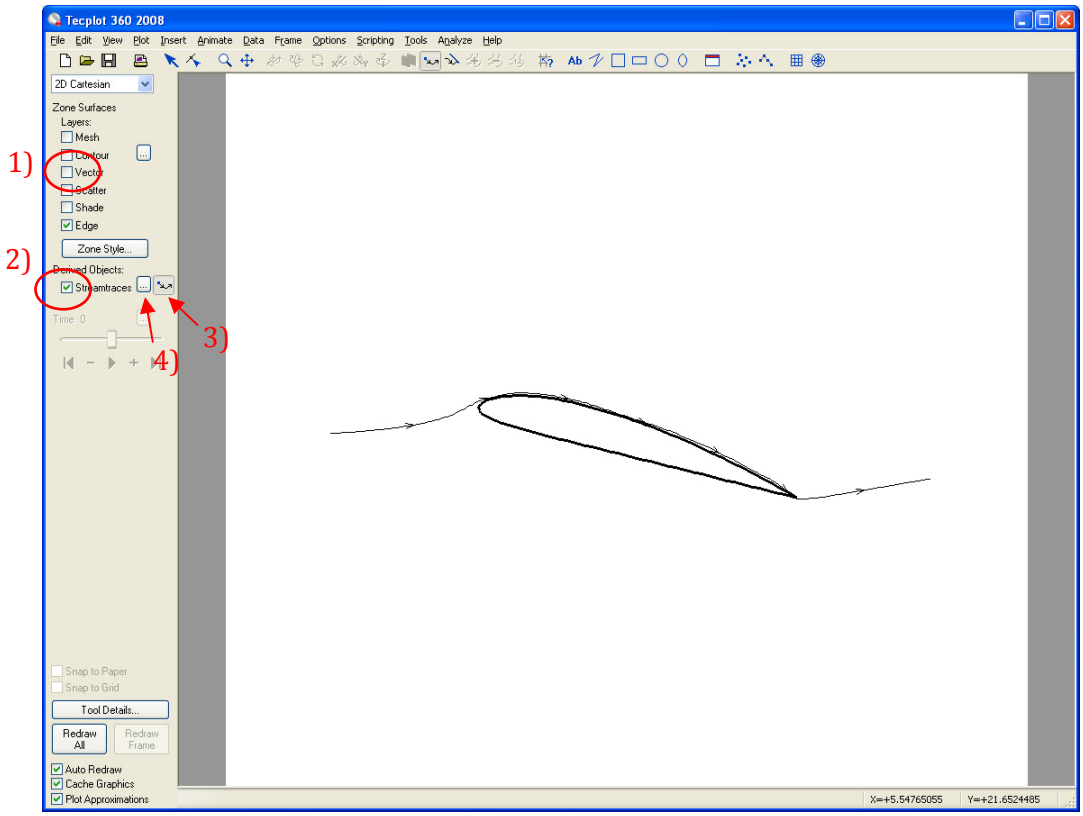
Typical example of output



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

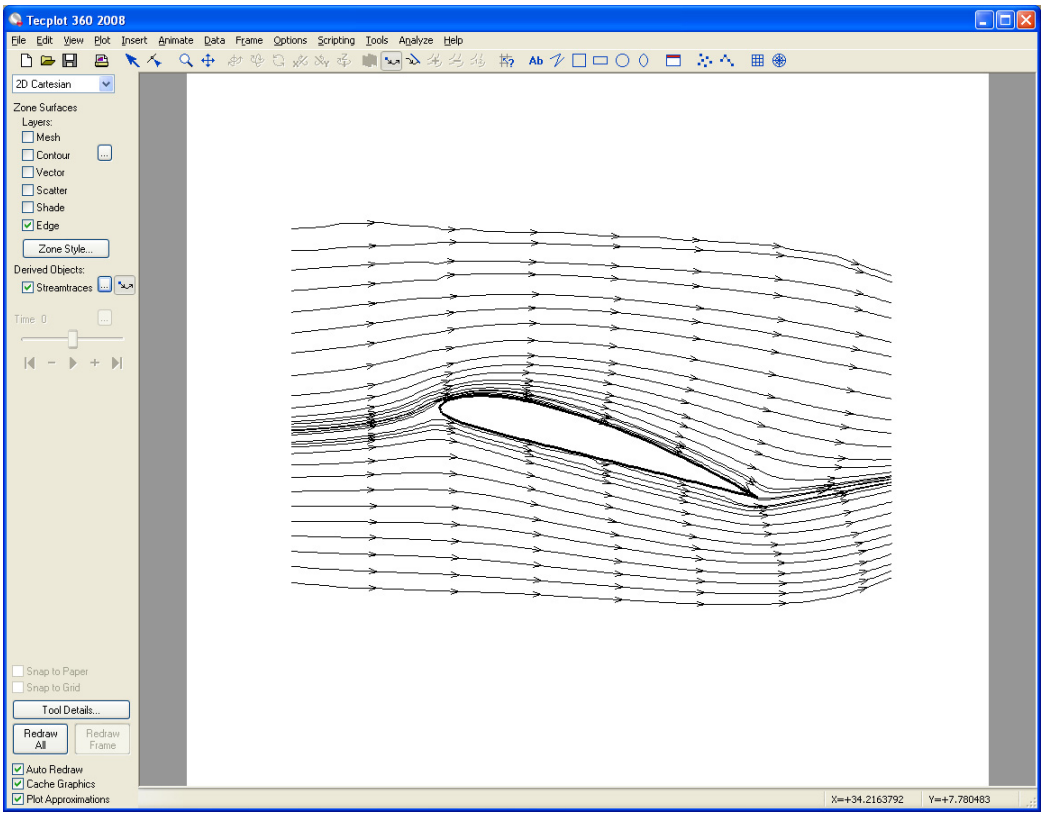
3.3 STREAMLINE PLOT



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

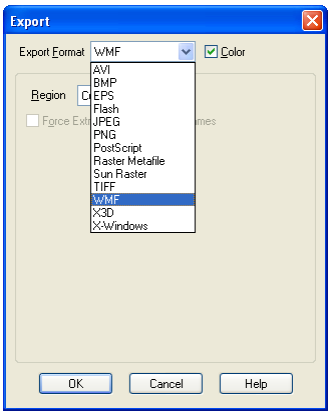
Export the figure file and save the layout file. See sections 4 and 5, respectively.

Typical example of streamline figure

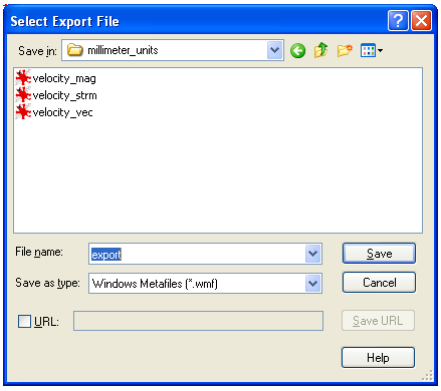


4. EXPORTING FIGURE FILES

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’)