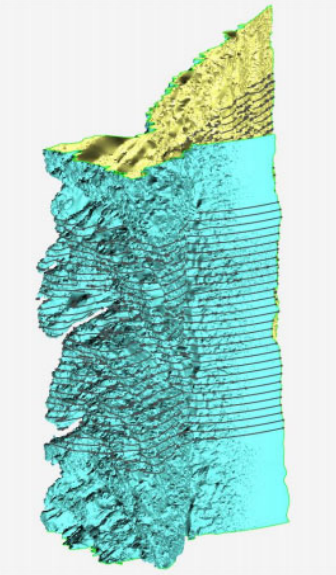
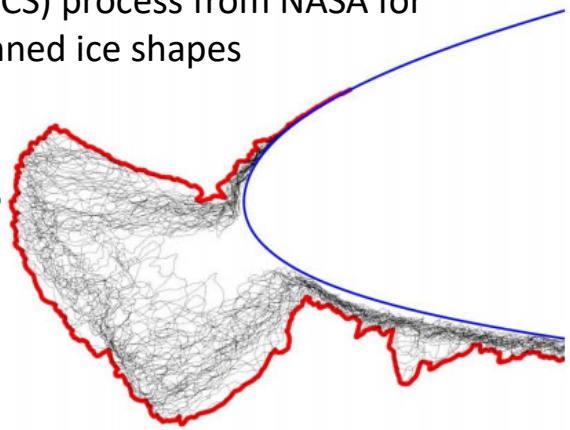
MCCS extraction workflow propsal

Isik Ozcer

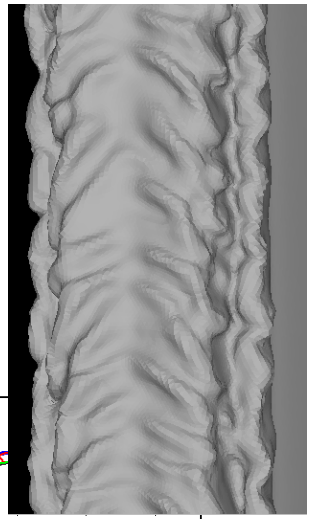
MCCS extraction from 3D ice shapes

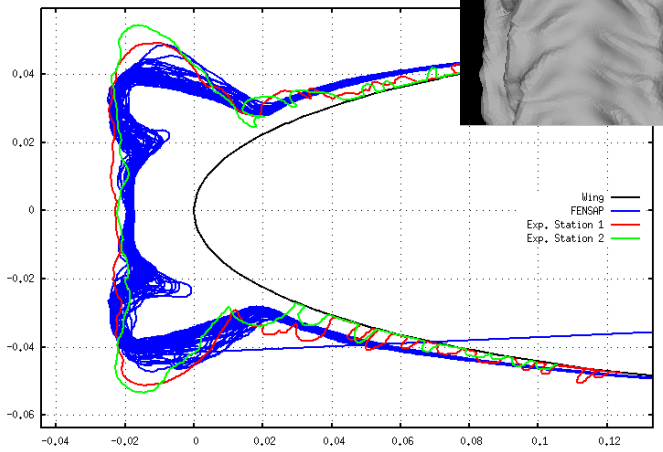


Maximum combined cross section (MCCS) process from NASA for scanned ice shapes



3D icing codes: need to develop a similar post processing approach

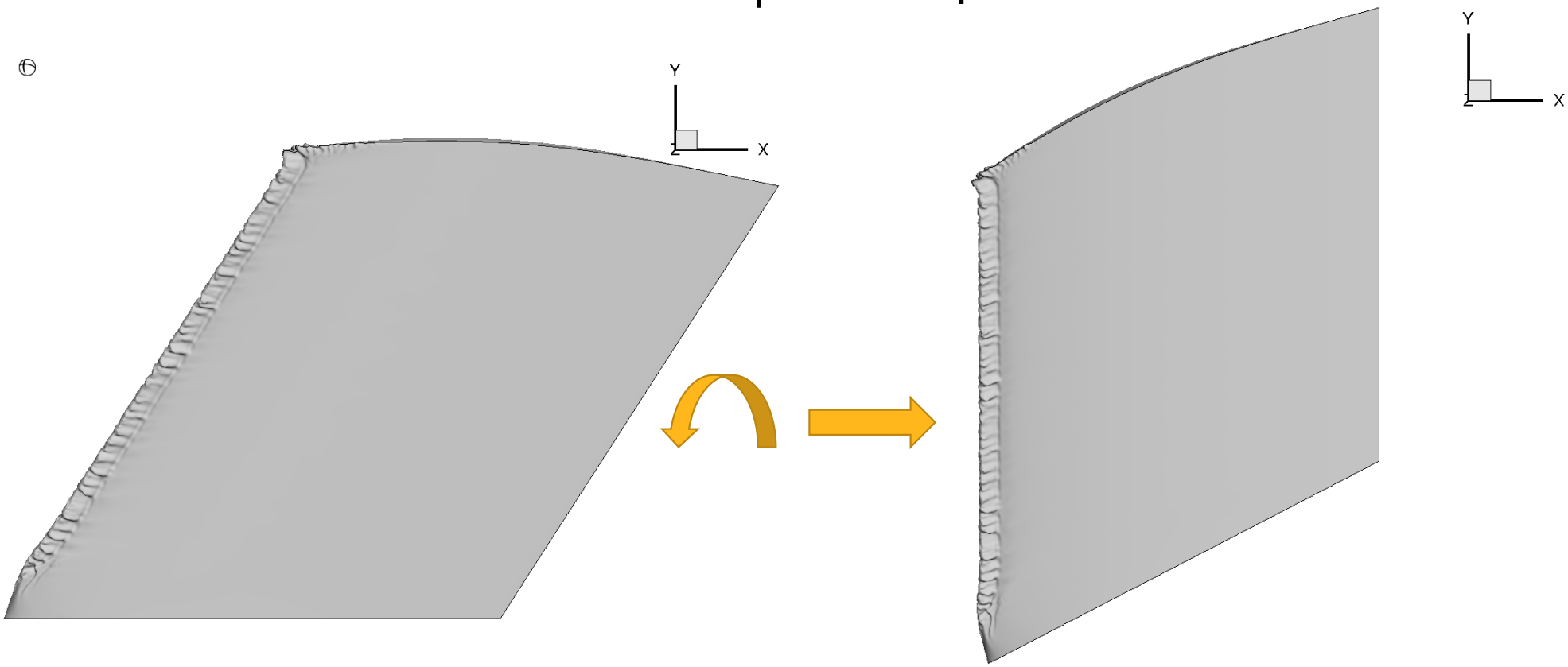




MCCS is an ice shape documentation technique for scallop ice shapes that form on swept wings

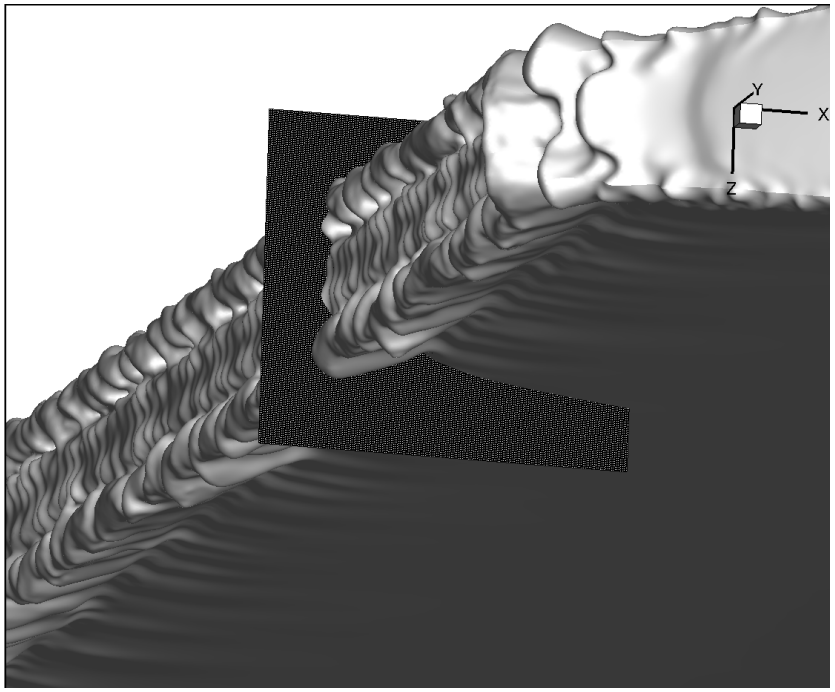
Ice prediction workshop data submission requirement

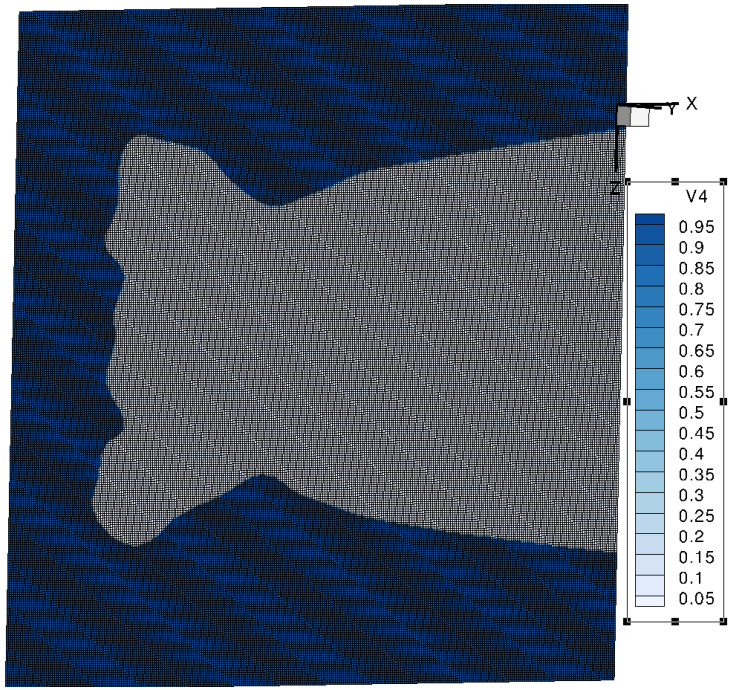
MCCS extraction from 3D ice shapes – tecplot workflow



Need to have the final ice shape with a volume mesh around it
Start by loading that into tecplot and rotating the dataset to line up the LE with the Y coordinate

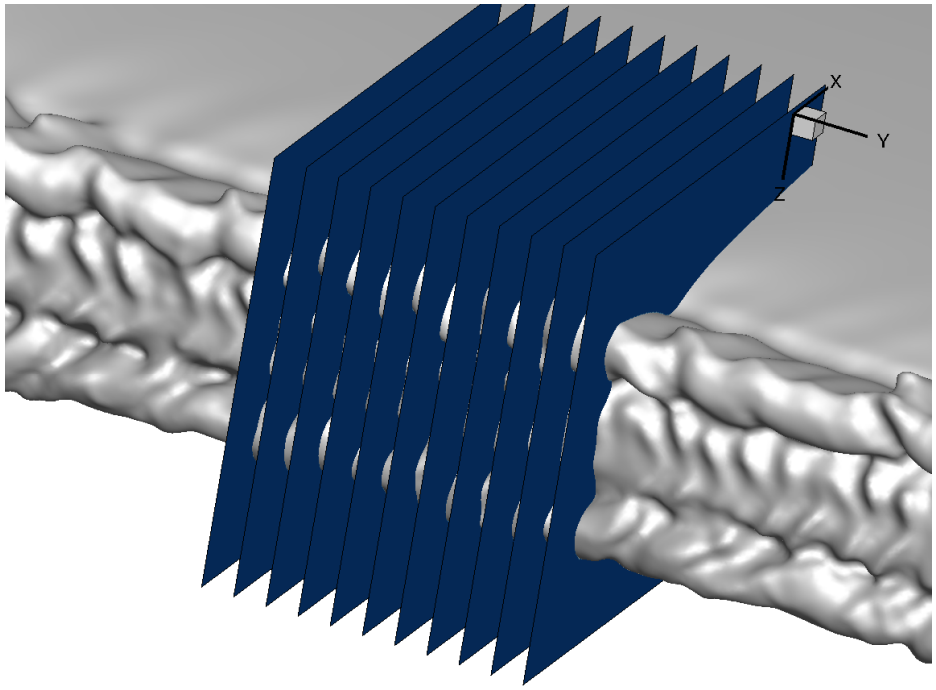
MCCS extraction from 3D ice shapes – tecplot workflow



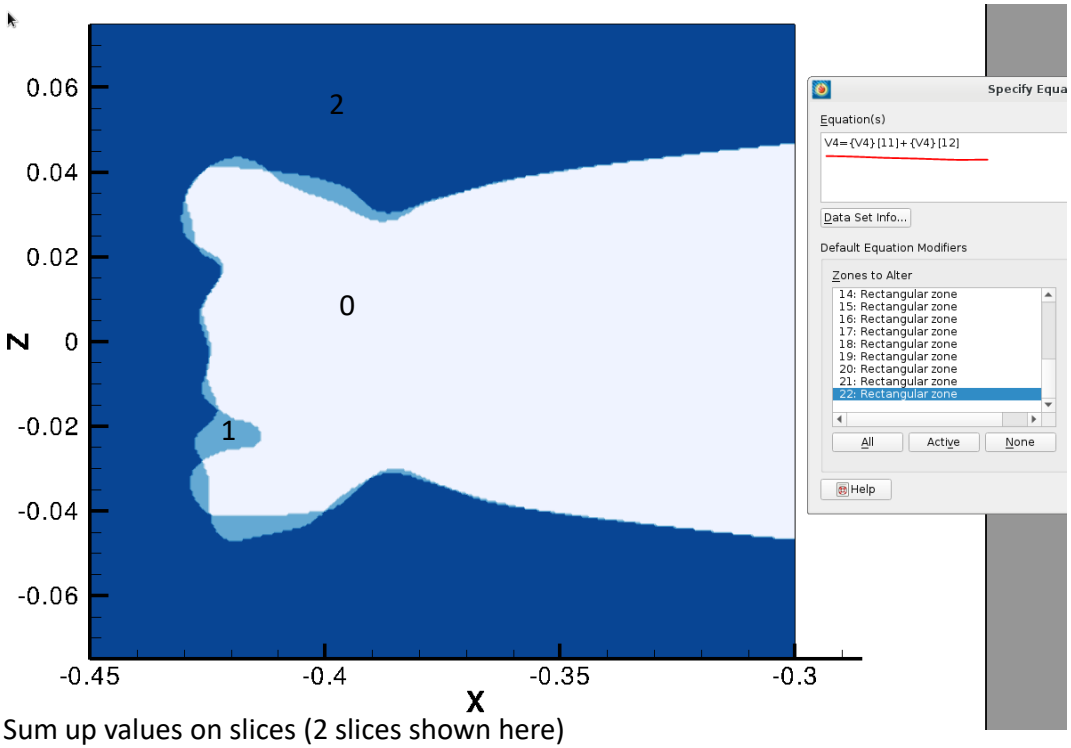


Create a bounded rectangular bounded slice (0.5mm resolution here),
Create a uniform scalar = 1 in the volume around the ice,
Interpolate to the slice to get 0/1 to identify the ice boundary at this slice station

MCCS extraction from 3D ice shapes – tecplot workflow

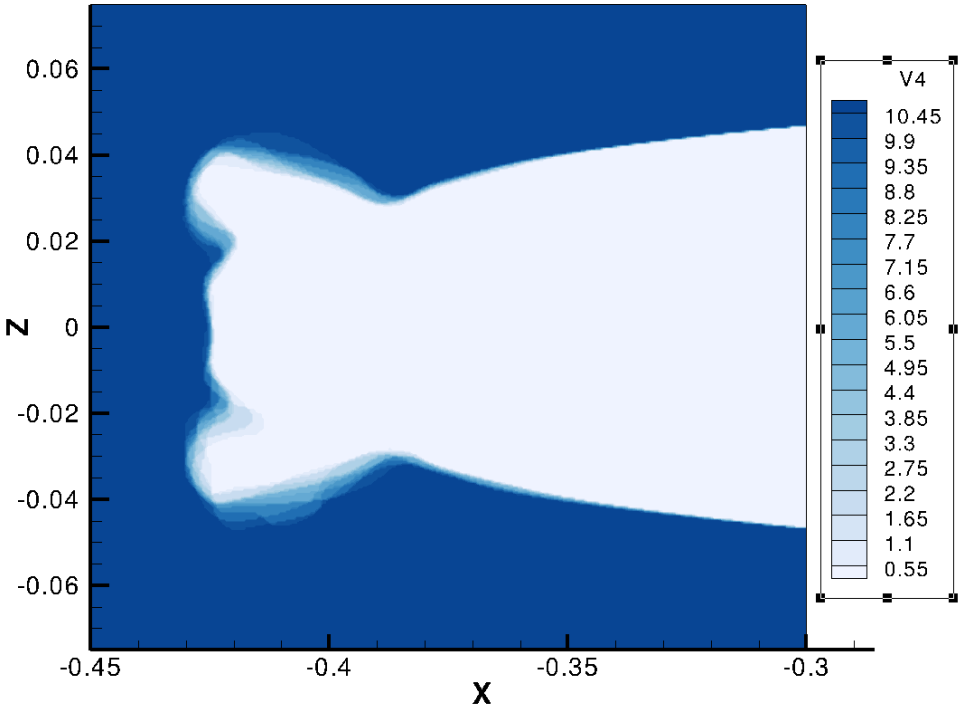


Repeat for more slices

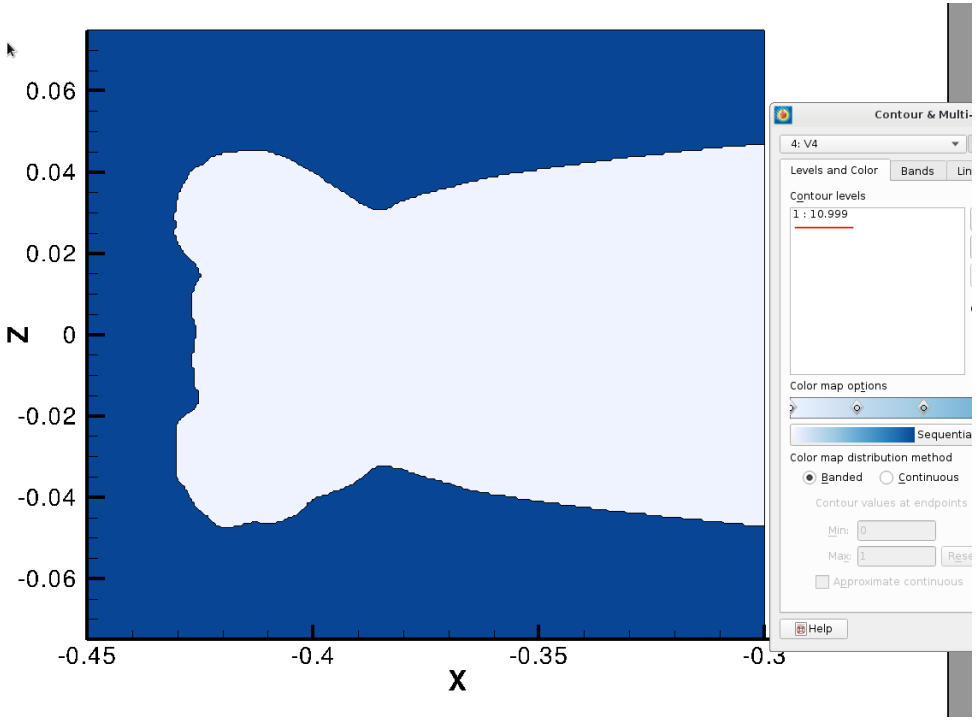


Sum up values on slices (2 slices shown here)

MCCS extraction from 3D ice shapes – tecplot workflow

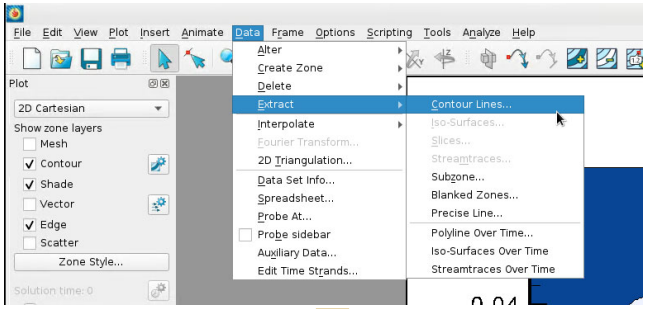


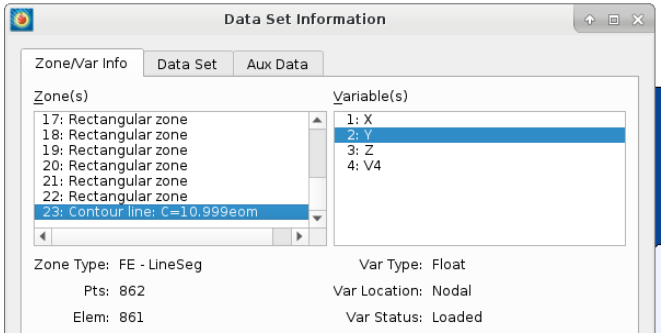
11 slices summed up, variable range 0 - 11

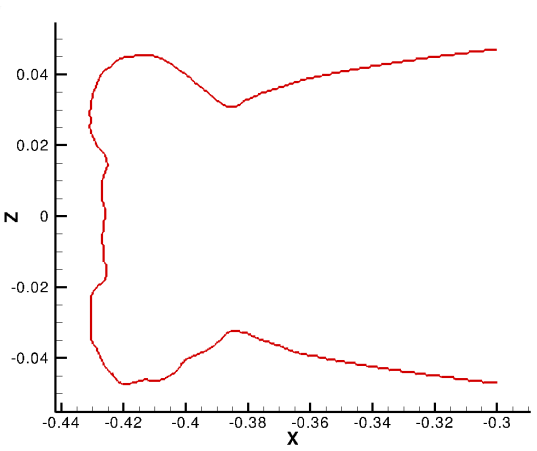


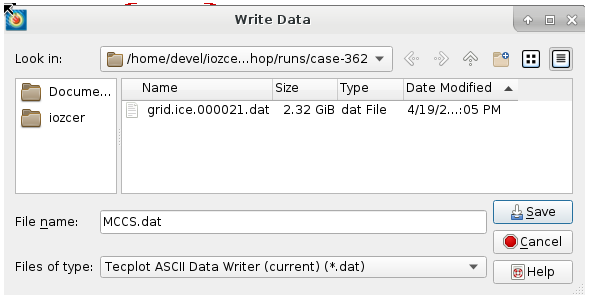
Reduce contour level to 1, set value ~ max (11) → MCCS!

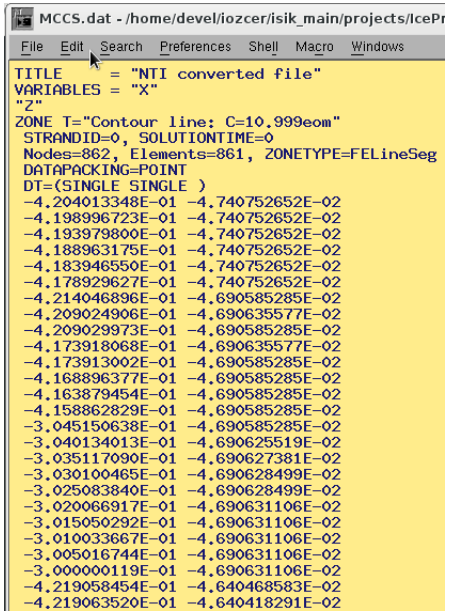
MCCS extraction from 3D ice shapes – tecplot workflow











Contour lines can be extracted as data sets


Ansys