

CFD Meshing

Lecture 16



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Outline

y^+

Richardson Extrapolation

Automatic Mesh Adaptation Example

Meshing

y^+

What size cells do we need to adequately resolve the boundary layer?

Example: Airfoil

chord = 1.0 m

$V_\infty = 21$ m/s

sea level conditions: $\nu = 1.5 \times 10^{-5}$

How large should I make my first cell in the boundary layer?

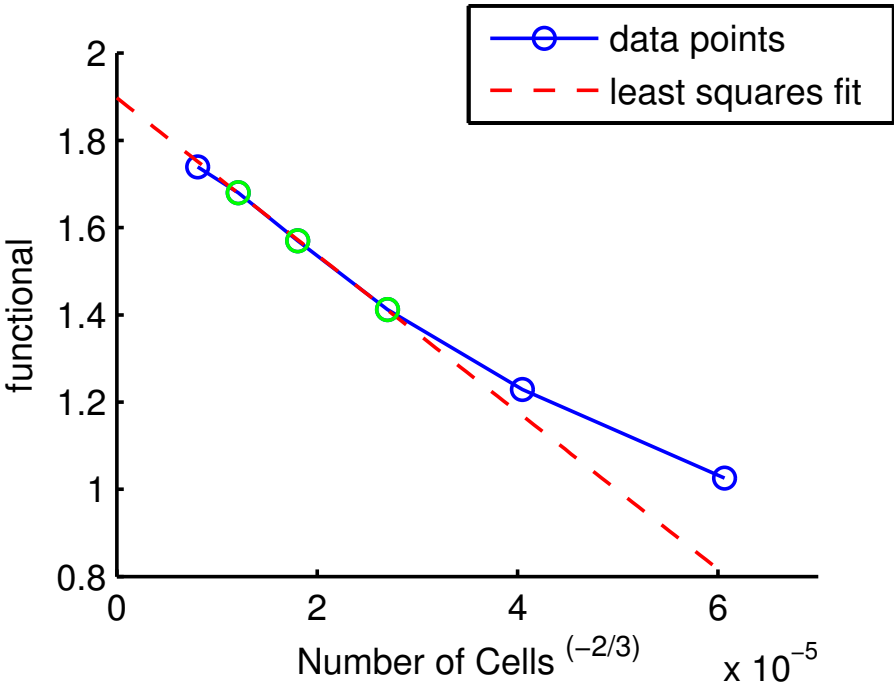
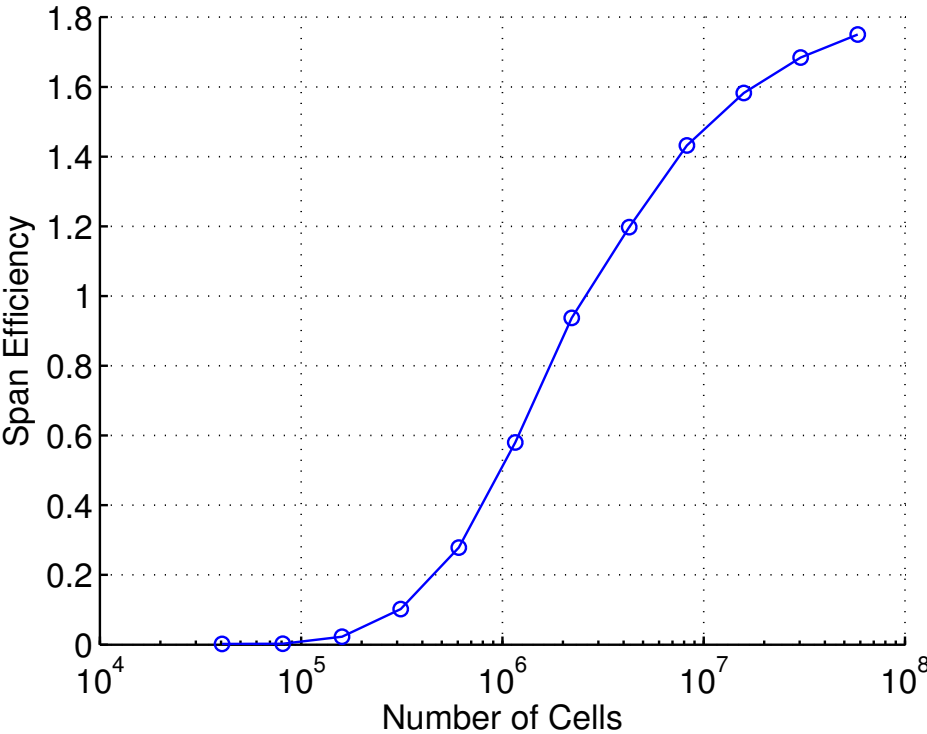
Richardson Extrapolation

Richardson Extrapolation

Grid convergence study: What if you can't afford to run until the metric of interest levels out?

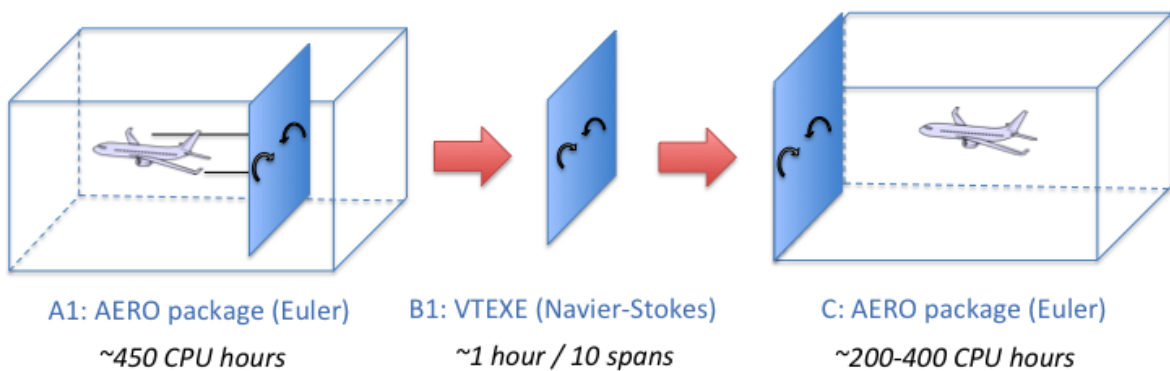
$$f = mh^p + f^*$$

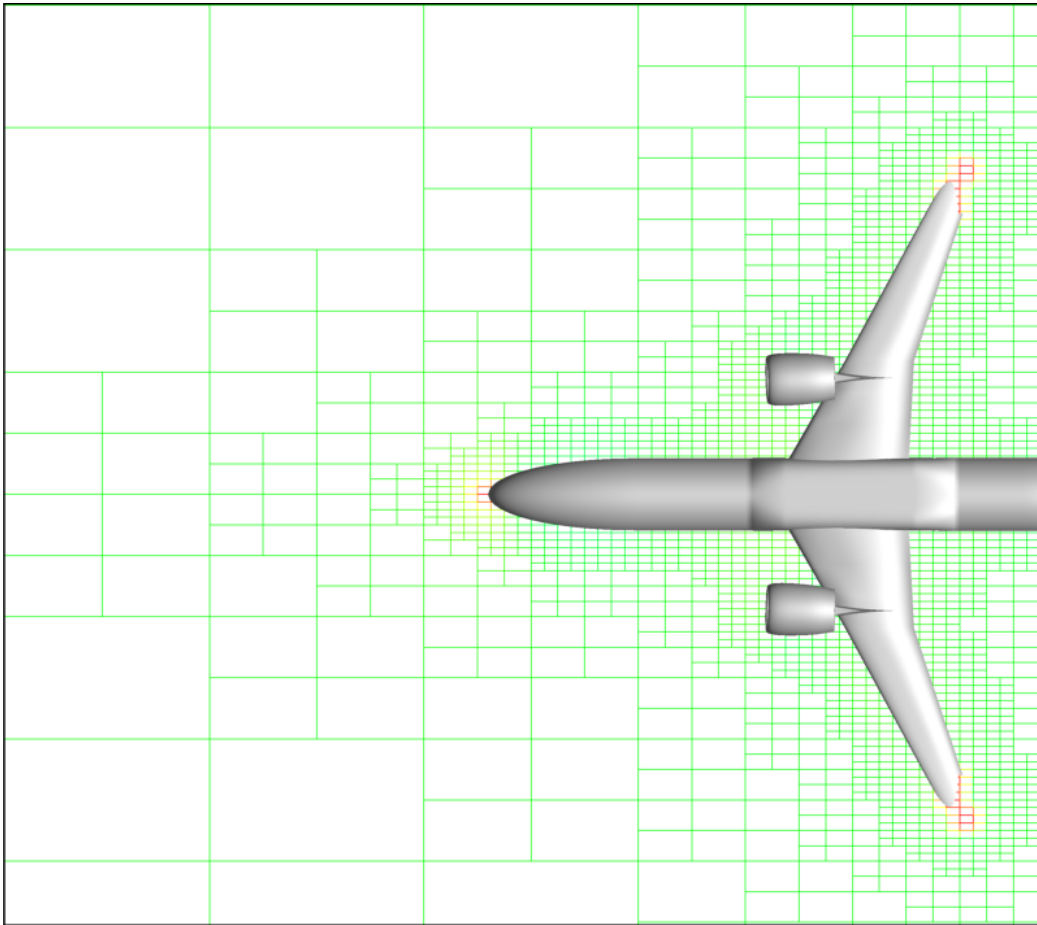
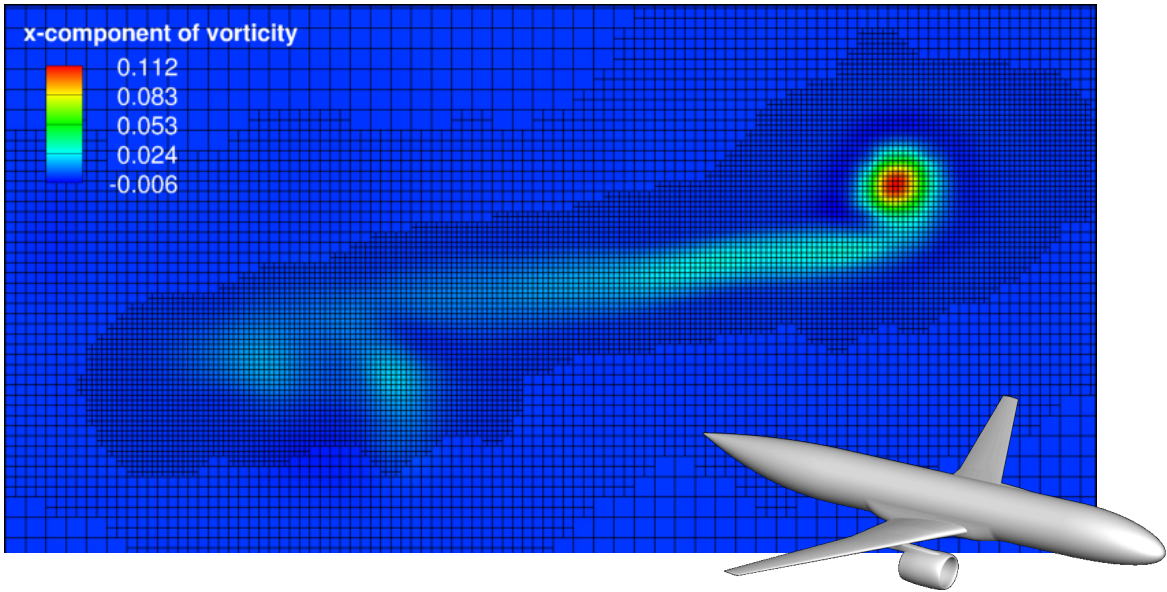
Example (formation flight with Cart3D)

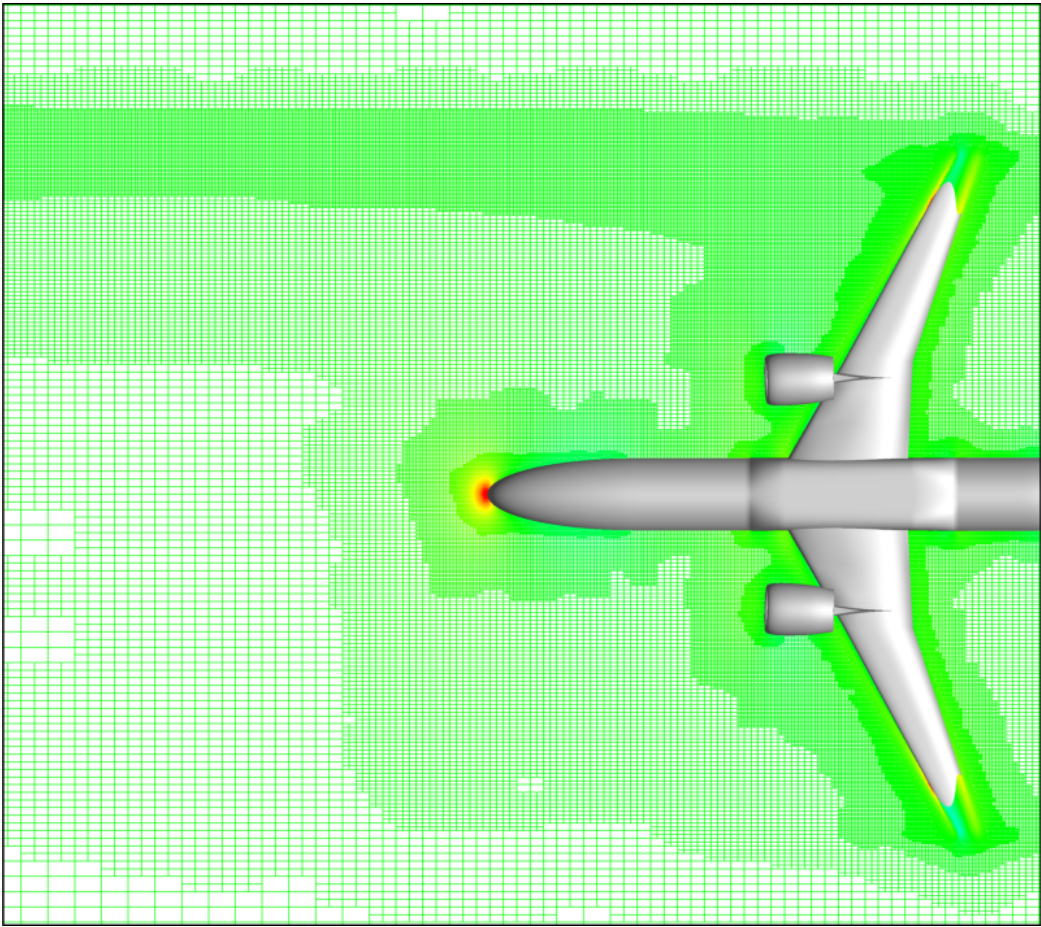


Automatic Mesh Adaptation Example

Automatic Mesh Adaptation Example







Sonic Boom Example

Meshing

Meshing

See notes from [André Bakker](#)

<http://www.bakker.org/dartmouth06/engs150/07-mesh.pdf>