Modal Analysis of a Wing - Verification & Validation

Author: Benjamin Mullen, Cornell University
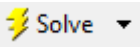
Verification & Validation

Refine the Mesh

One of the ways we can check the validity of our analysis is by refining our mesh. If the values for our frequencies approach a limit, then we have arrived at our answer. If the values change drastically when we refine the mesh, then we need to refine the mesh further and we have not yet found an acceptable solution. We will refine the mesh by increasing the number of divisions in our edge sizing. In the *Outline* window, go to **Mesh > Edge Sizing > Number of Divisions >** `100`. Also, go to **Mesh > Edge Sizing 2 > Number of Divisions >** `40`. Our new mesh looks like this:
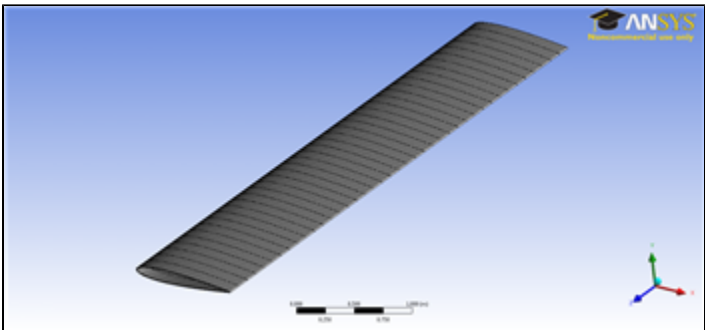
Click here to enlarge

Our new mesh has 8000 elements: 4 times as many elements as our unrefined mesh. Click [Solve], and look at the values for the modal frequencies. A table comparing the unrefined mesh and the refined mesh is here:

Mode Number	Frequency (Unrefined Mesh)	Frequency (Refined Mesh)
1	4.8329	4.8297
2	25.327	25.236
3	32.175	32.155
4	38.089	38.038
5	48.315	48.063
6	53.540	53.403

Because the values don't change much, we don't have to refine the mesh further. We are done!

Go to Exercises

Go to all ANSYS Learning Modules