The Closed-Duct PRIME model is provided in two file formats compatible with many popular commercial CAD software.

Additionally, 13 triangular surface meshes (coarsest to finest mesh: $\sim 1 \times 10^4$ to $\sim 4.5 \times 10^7$ elements) are provided in two file formats.

All model and mesh files are that of the full-scale model ($L \approx 49.4$ ft, the largest size in the problem set).

Model File: IGES Format

IGES or IGS file is a standard text-based graphics file based on the Initial Graphics Exchange Specification (IGES). The Closed-Duct PRIME model in IGS format is contained in the file "Closed-Duct_PRIME_model_s7.igs". The geometry coordinates in the IGES model are specified in units of meters.

Model File: STL Format

STL is a commonly used file format for additive manufacturing. The Closed-Duct PRIME model in STL format is contained in the file "Closed-Duct_PRIME_model_s7.stl". This file was used to additively manufacture the scale models measured in [1]. The geometry coordinates in the STL model are specified in units of meters.

Mesh Files: File Names

	Mesh AA	Mesh AB	Mesh BB	Mesh BC	Mesh CC	Mesh CD	Mesh DD
Average Edge Length (m)	2.039×10^{-1}	1.450×10^{-1}	9.903×10^{-2}	7.303×10^{-2}	5.248×10^{-2}	3.644×10^{-2}	2.450×10^{-2}
Maximum Edge Length (m)	3.028×10^{-1}	2.147×10^{-1}	1.517×10^{-1}	1.090×10^{-1}	8.625×10^{-2}	5.353×10^{-2}	3.429×10^{-2}
Minimum Edge Length (m)	1.4461×10^{-2}	1.434×10^{-2}	1.431×10^{-2}	1.243×10^{-2}	2.371×10^{-3}	1.036×10^{-2}	6.502×10^{-3}
Number of Triangles	10 404	20 360	43 528	80 214	155 432	321 572	711 538
	Mesh DE	Mesh EE	Mesh EF	Mesh FF	Mesh FG	Mesh GG	
Average Edge Length (m)	1.825×10^{-2}	1.175×10^{-2}	9.039×10^{-3}	5.984×10^{-3}	4.522×10^{-3}	3.156×10^{-3}	
Maximum Edge Length (m)	2.711×10^{-2}	1.674×10^{-2}	1.325×10^{-2}	9.200×10^{-3}	6.628×10^{-3}	5.093×10^{-3}	
Minimum Edge Length (m)	3.883×10^{-3}	3.063×10^{-3}	2.567×10^{-3}	1.760×10^{-3}	1.858×10^{-3}	8.892×10^{-4}	
Number of Triangles	1 282 414	3 095 098	5 222 704	11 912 040	20 864 076	45 008 820	

Mesh Files: INP Format

13 triangular surface meshes are provided in INP format. The first line contains the number of nodes, *Nnodes*, and triangles, *Ntris*, in the mesh. The next *Nnodes* lines contain the x,y,z coordinates of each node in the mesh. The final *Ntris* lines of the file contain the connections for each triangular element in the mesh. The node coordinates in the INP files are specified in units of meters.

Mesh Files: UNV Format

13 triangular surface meshes are also provided in Universal File (UNV) format. The node coordinates in the UNV files are specified in units of inches.

Uncompressing Mesh Files

Due to Github's intrinsic file size limit (100 MB), all mesh files were zipped. They can be uncompressed using standard zip programs.

The finest INP format mesh files "Closed-Duct_model_meshEF", "Closed-Duct_model_meshFF", "Closed-Duct_model_meshFG", and "Closed-Duct_model_meshGG" were split into 2, 4, 6, and 12 files, respectively, and then separately zipped.

The finest UNV format mesh files "Closed-Duct_model_meshEE", "Closed-Duct_model_meshEF", "Closed-Duct_model_meshFF", "Closed-Duct_model_meshFG", and "Closed-Duct_model_meshGG" were split into 2, 3, 7, 12, and 24 files, respectively and then separately zipped.

After uncompressing, the files should be concatenated into a single file; e.g., the following linux commands will concatenate the files:

```
cat Closed-Duct_PRIME_model_meshDE.inp* > Closed-Duct_PRIME_model_meshDE.inp
cat Closed-Duct_PRIME_model_meshDE.unv* > Closed-Duct_PRIME_model_meshDE.unv
```

References

[1] J. T. Kelley, A. Maicke, D. A. Chamulak, C. C. Courtney, and A. E. Yılmaz, "Adding a reproducible airplane model to the Austin RCS Benchmark Suite," in *Proc. Applied Comp. Electromagnetics Society (ACES) Symp.*, July 2020.