FSI analysis for the flapping sheet

Fluid flow is modeled using the **unsteady vortex lattice method (UVLM)**. A flexible sheet is modeled using the **finite element method (FEM)** with **absolute nodal coordinate formulation (ANCF)** for the shell element. This is done to reproduce the deformation of a plate while considering the spanwise deformation and geometrical nonlinearity.

This code is for MATLAB R2007b – R2018a.

[Step 1] Install the ToolBoxes
The following ToolBoxes in "./ ToolBoxes/" are required,

- **"Meshing a plate using four noded elements"** by KSSV
  https://jp.mathworks.com/matlabcentral/fileexchange/33731-meshing-a-plate-using-four-noded-elements

- **"mmwrite"** by Micah Richert:
  https://jp.mathworks.com/matlabcentral/fileexchange/15881-mmwrite

- **"Quiver 5"** by Bertrand Dano:
  https://jp.mathworks.com/matlabcentral/fileexchange/22351-quiver-5?s_tid=FX_rc3_behav

- **"Sparse sub access"** by Bruno Luong:
  https://jp.mathworks.com/matlabcentral/fileexchange/23488-sparse-sub-access

- **"TriStream"** by Matthew Wolinsky:
  https://jp.mathworks.com/matlabcentral/fileexchange/11278-tristream

- **"Vectorized Multi-Dimensional Matrix Multiplication"** by Darin Koblick:
  https://jp.mathworks.com/matlabcentral/fileexchange/47092-vectorized-multi-dimensional-matrix-multiplication?s_tid=prof_contriblnk

[Step 2] Start GUI form
Open the "GUI.fig" from MATLAB.

[Step 3] Start analysis
Push the "exe" button and wait until the finish of the analysis.

[Step 4] Plot results
Push the "plot" button.