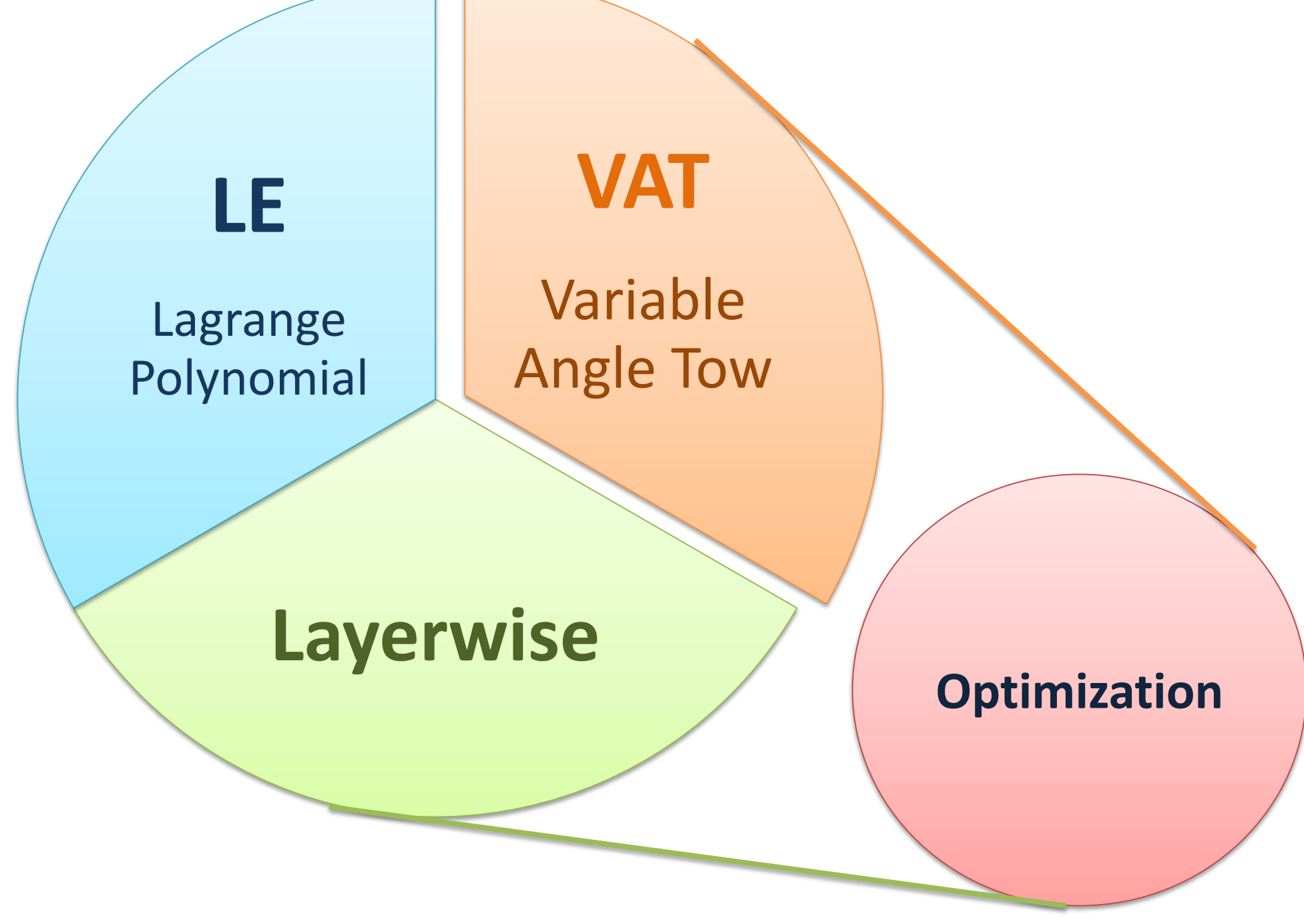


Overview

Carrera Unified Formulation (CUF)



Methodology

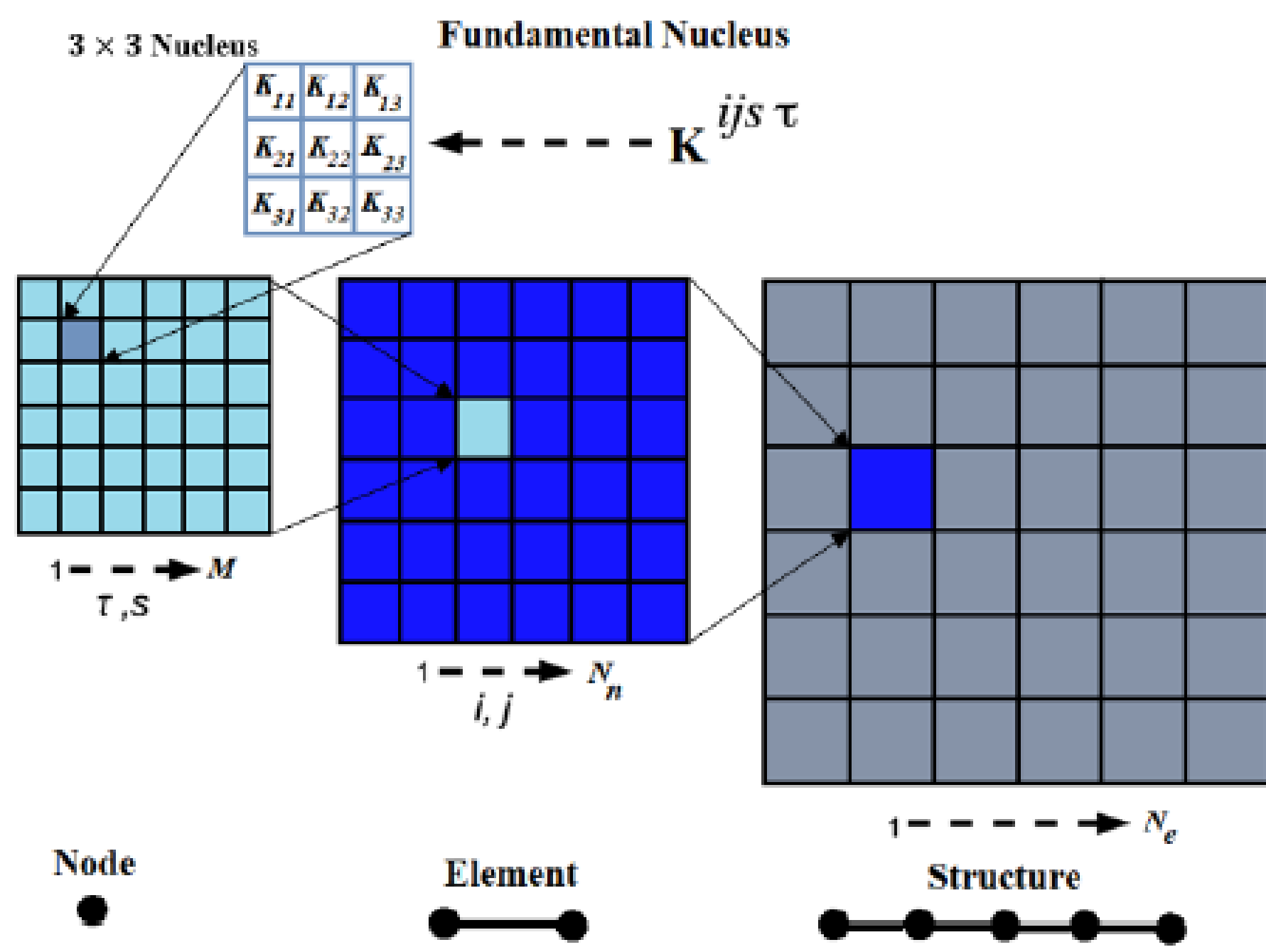
CUF: Carrera Unified Formulation

Comparison of classical and advanced methodologies for the analysis of VATs laminates by using Carrera Unified Formulation (CUF).

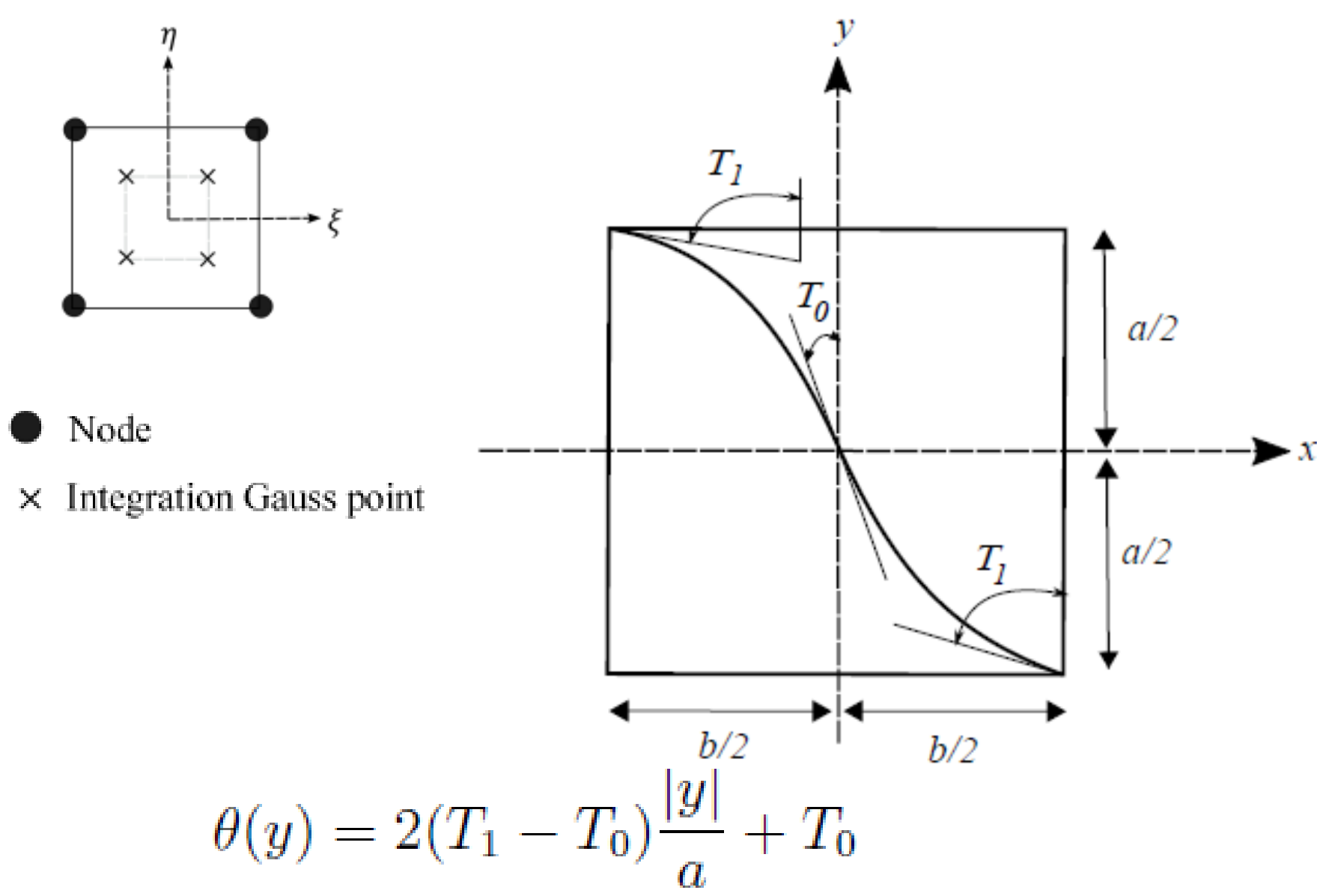
CUF is a variable-kinematics methodology to implement arbitrarily refined models, from classical to higher-order models.

$$u(x, y, z) = F_s(x, z)u_s(y), \quad s = 1, 2, \dots, M$$

F_s : functions of the coordinate x and z on the cross-section
 u_s : vector of the generalized displacements, along the beam axis
 M : number of the terms used in the expansion.



VAT Implementation



Paper Under Preparation:

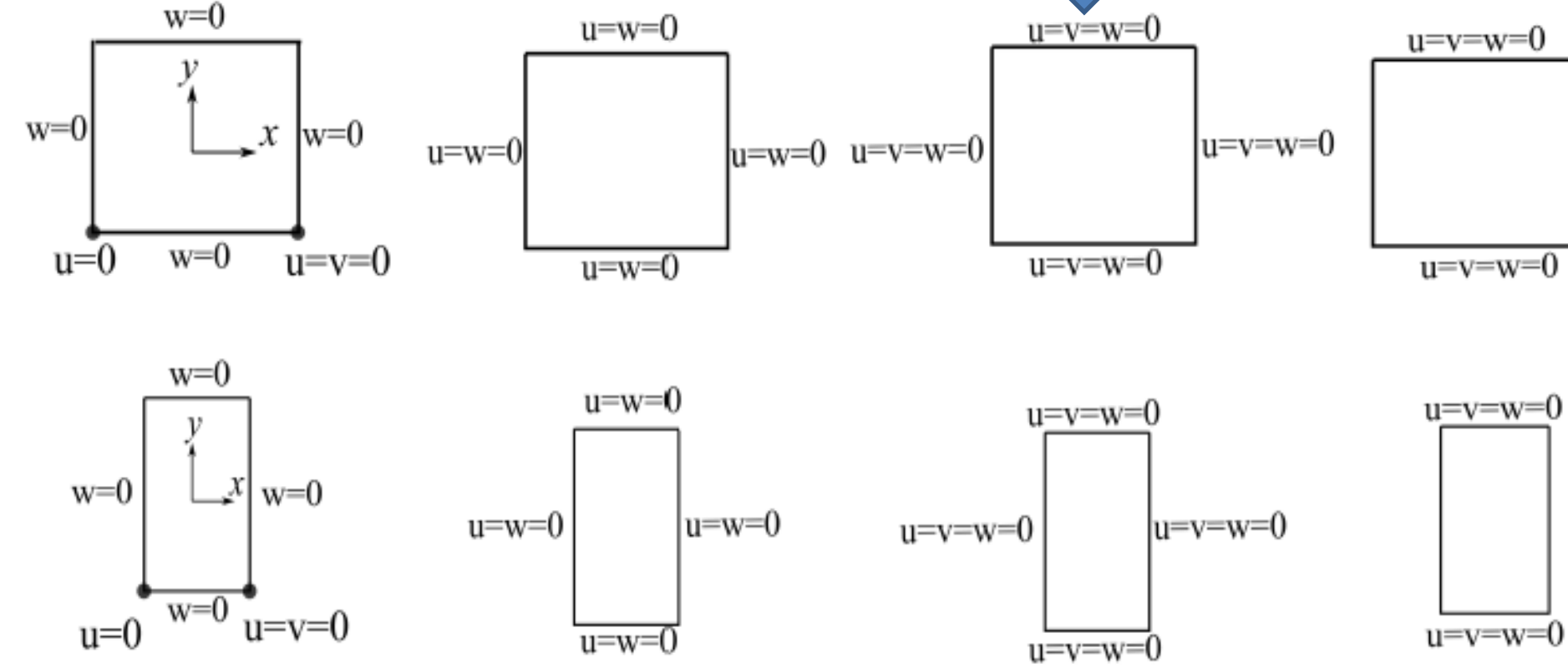
1. Robust Structural analysis of Variable Angle Tow by Higher order model
2. A review on one-dimensional classical and refined theories for laminated structures analysis.

Mail: Nasim.fallahi@polito.it

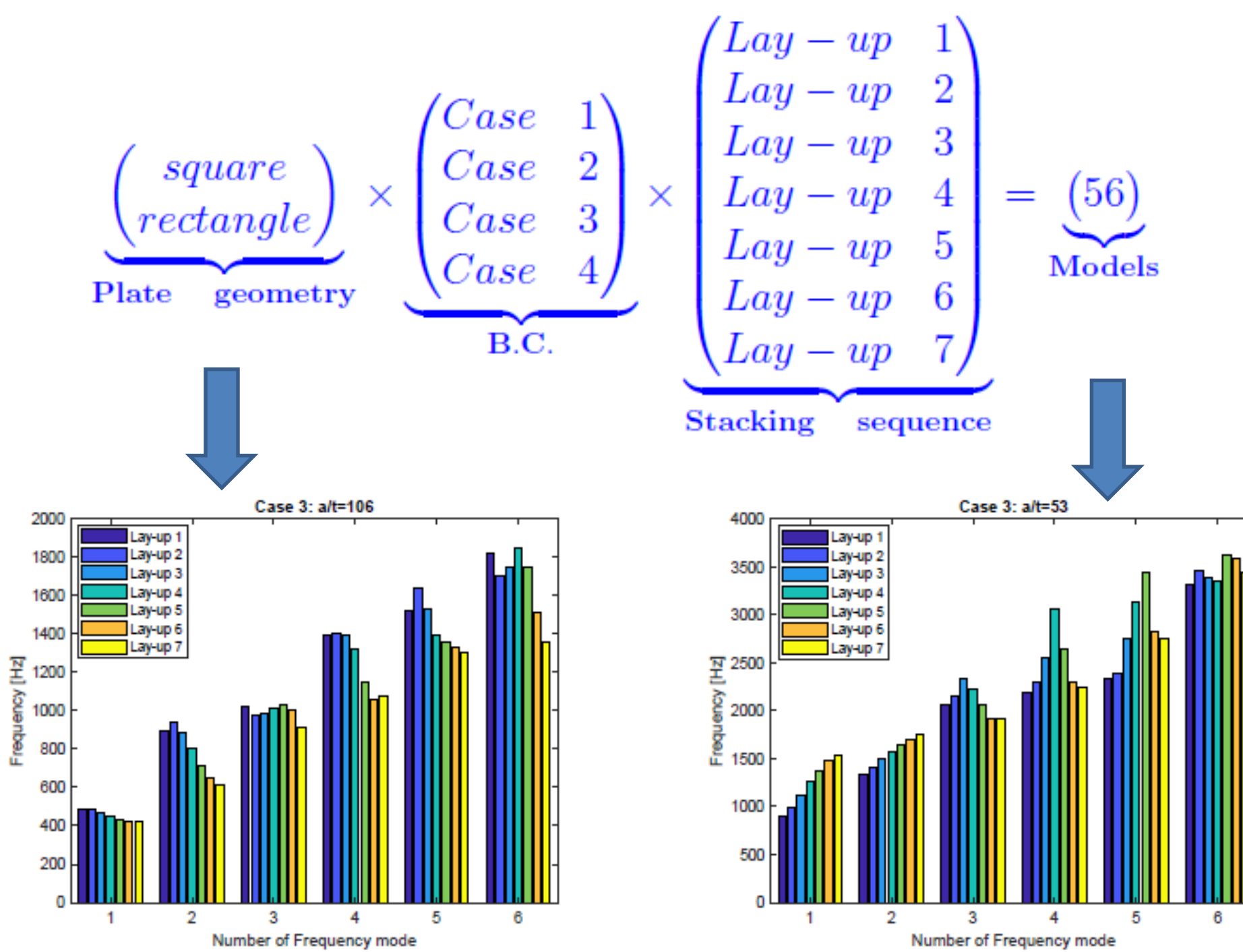
Web: www.mul2.com

Model Validation & Results

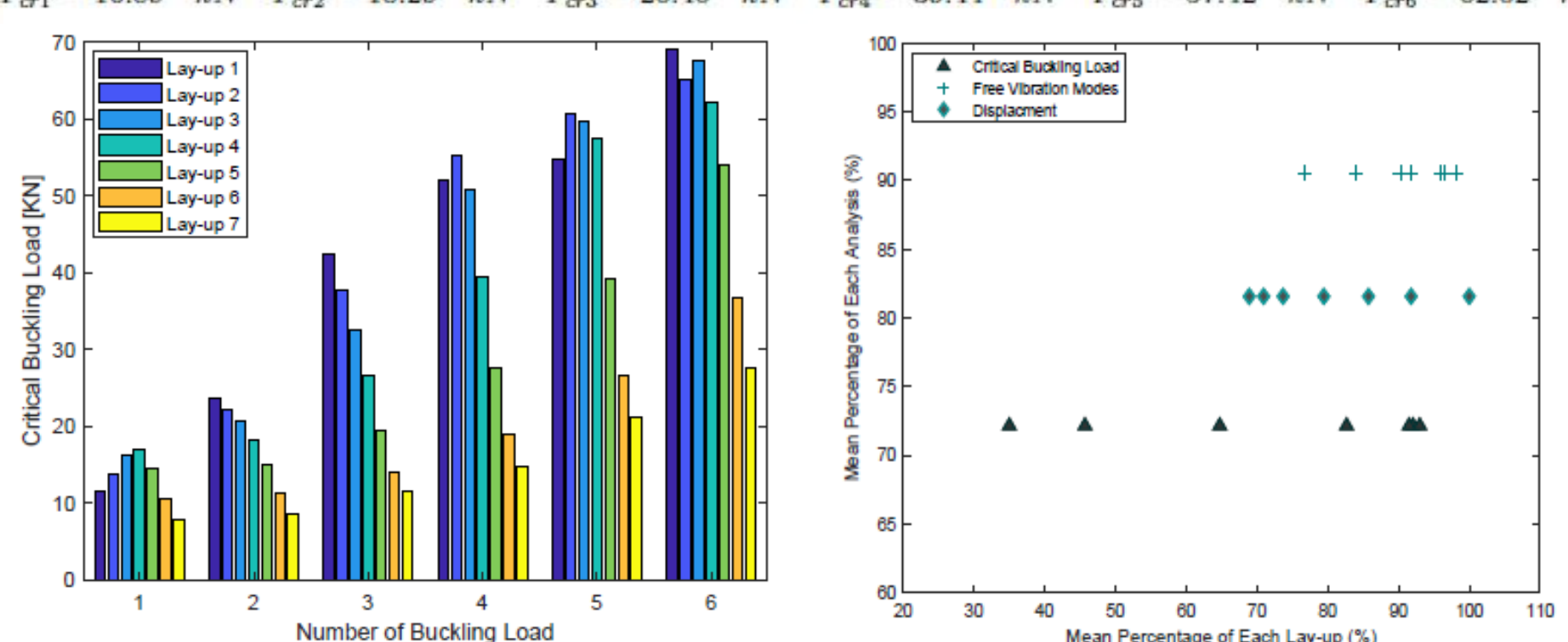
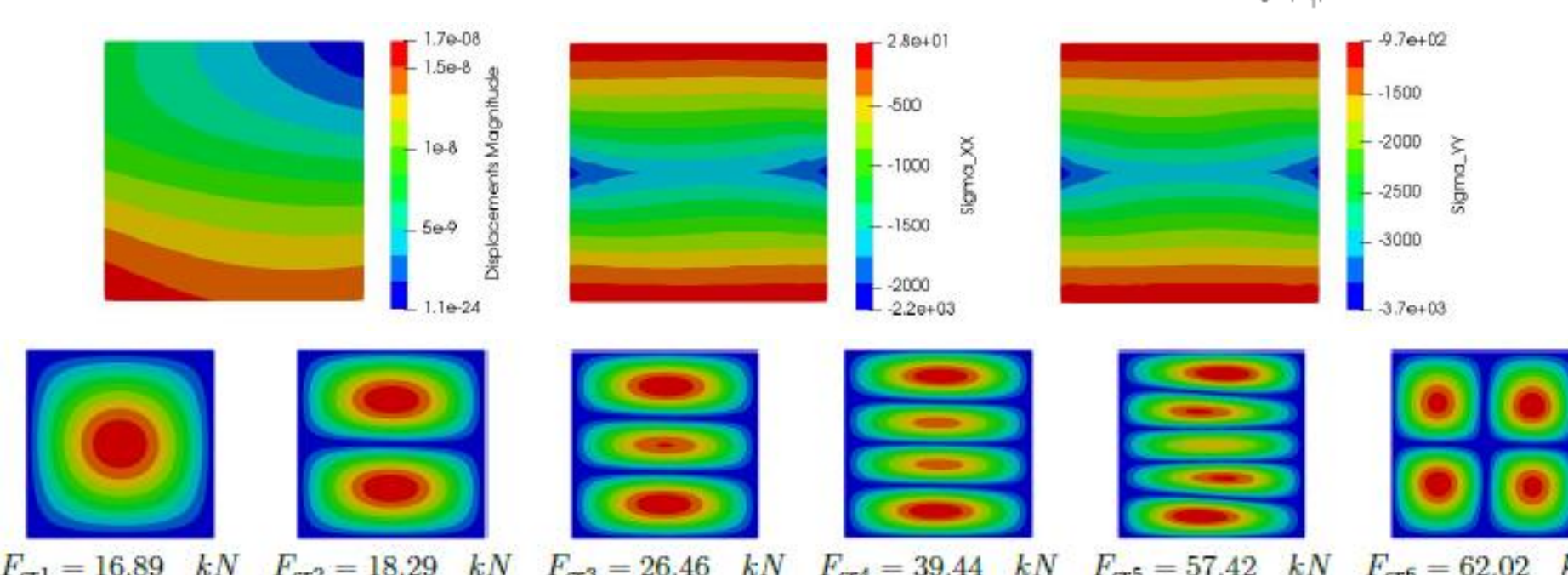
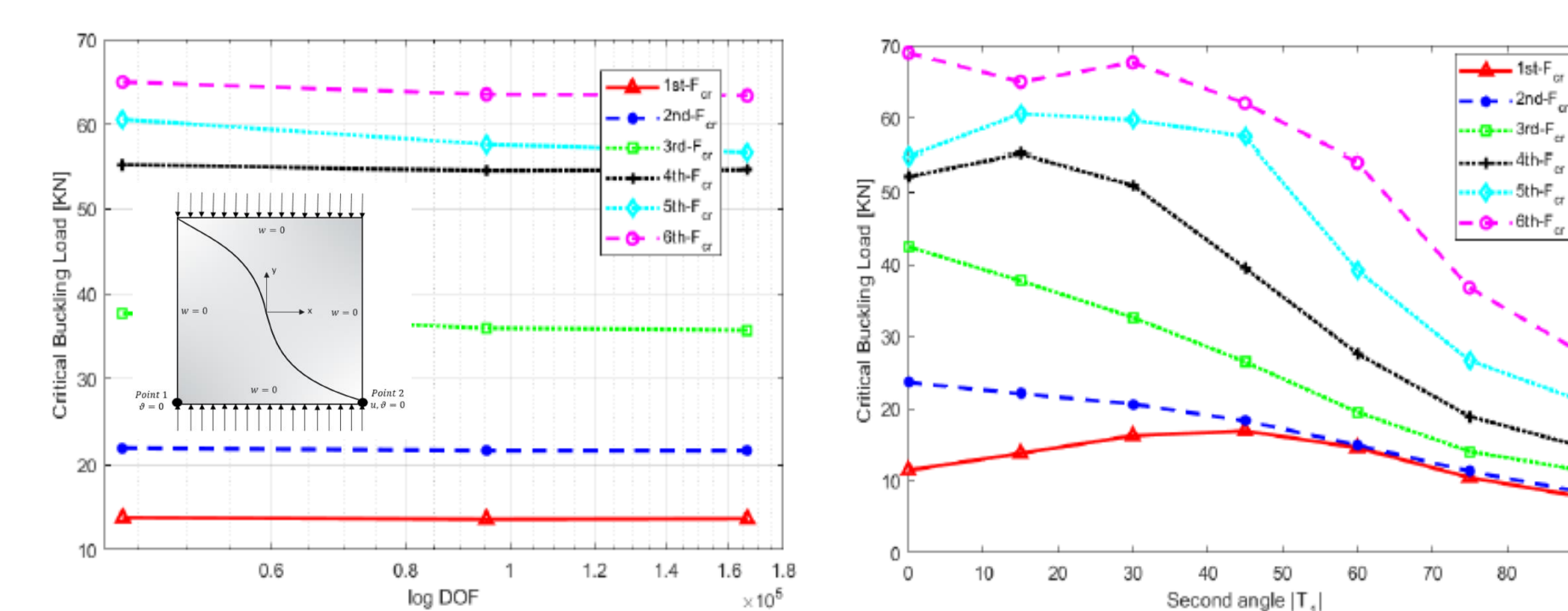
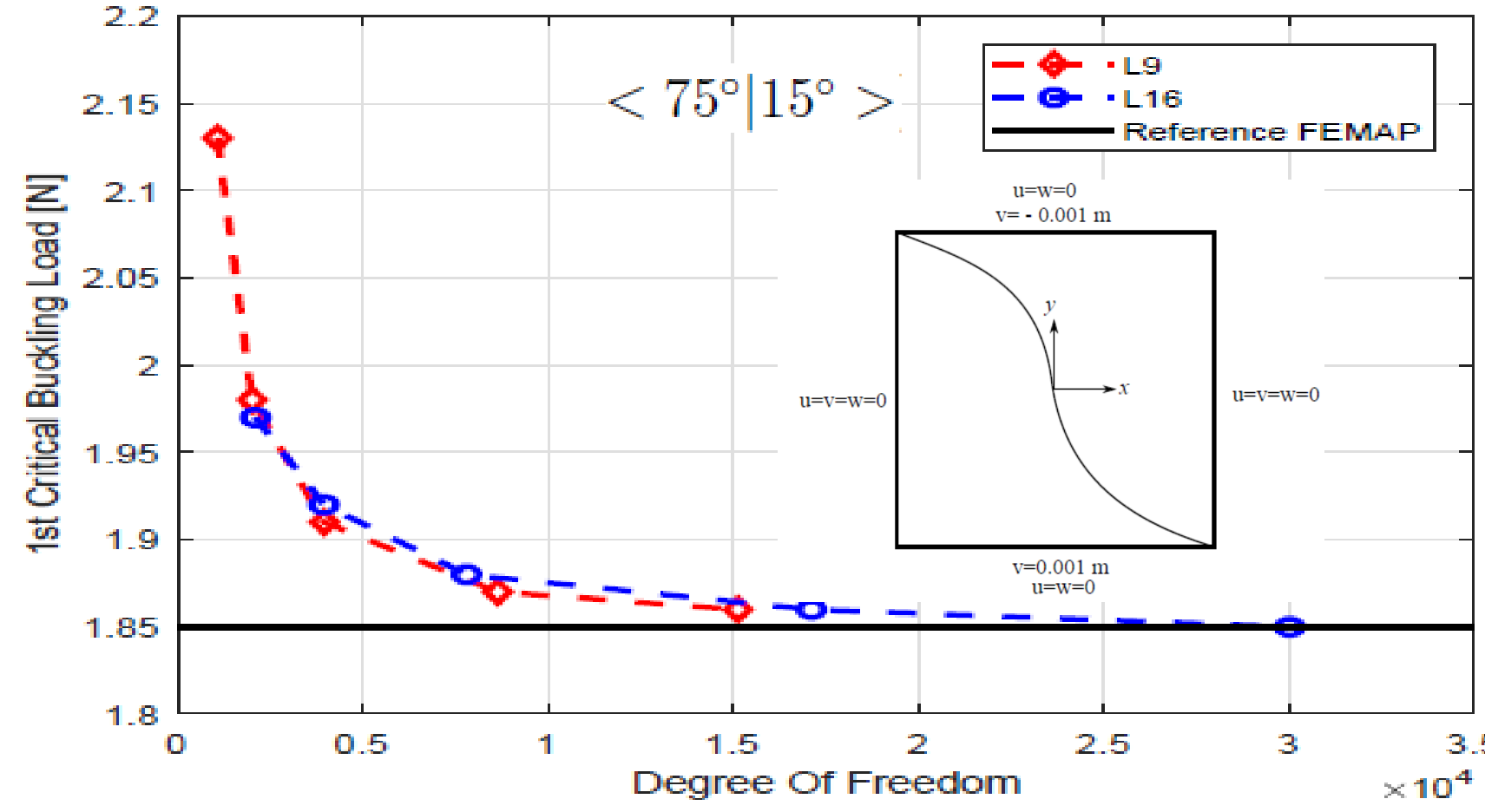
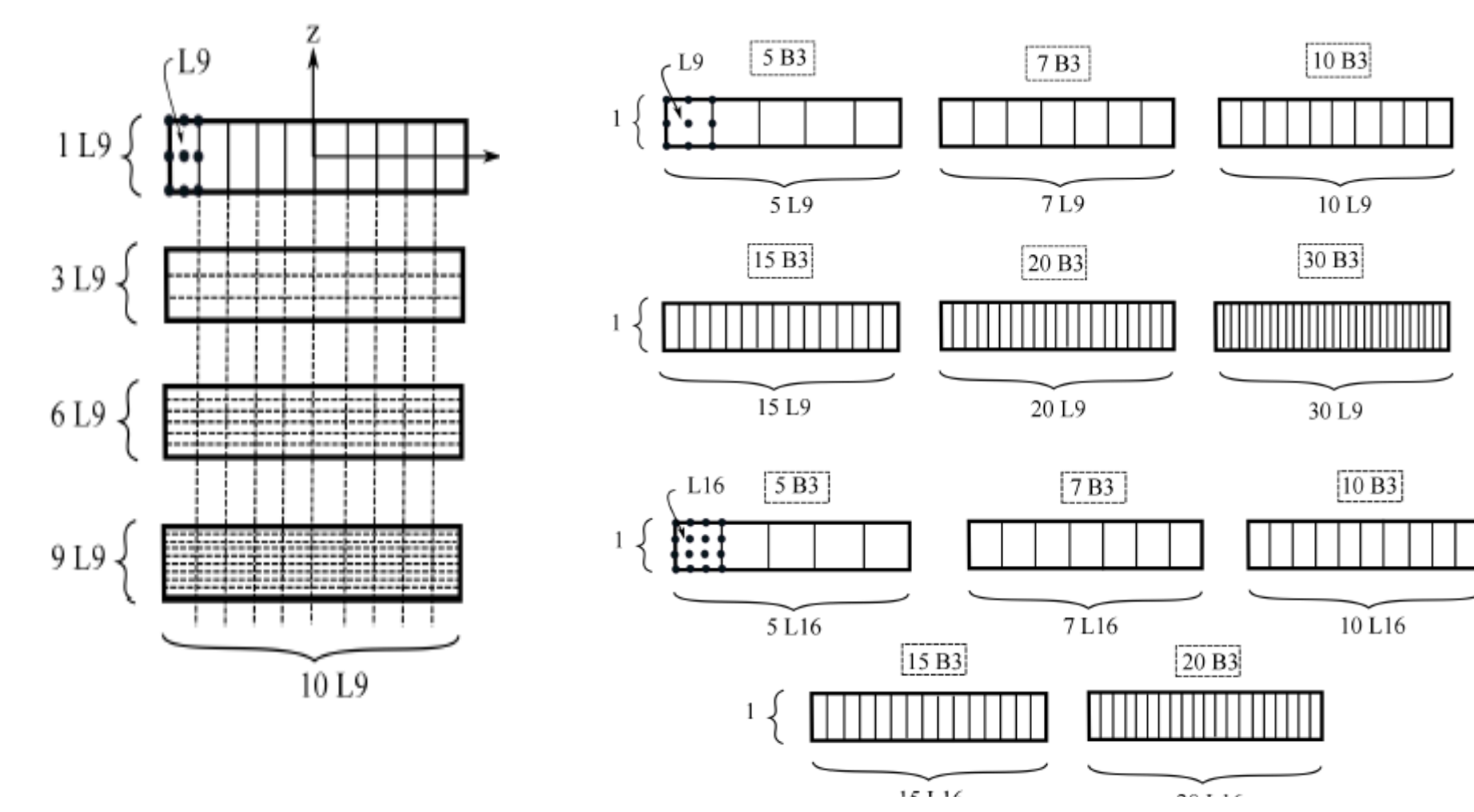
Free Vibration Analysis



Case of B.C.	Model	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6
Step by step	VAT	246.16	589.13	635.54	922.26	986.69	1147.02
	VAT	246.31	590.42	635.41	911.18	984.15	1149.90
1-a	VAT	481.32	930.96	971.99	1401.61	1628.54	1693.98
	VAT	483.44	935.55	974.59	1401.63	1636.83	1697.43
2-a	VAT	481.58	931.66	972.57	1402.92	1630.19	1695.05
	VAT	483.66	936.15	975.06	1402.73	1638.32	1698.27
3-a	VAT	191.82	252.82	508.47	511.88	577.43	939.20
	VAT	191.95	251.97	508.91	510.87	574.94	938.46
4-a	VAT	191.82	252.82	508.47	511.88	577.43	939.20
	VAT	191.95	251.97	508.91	510.87	574.94	938.46

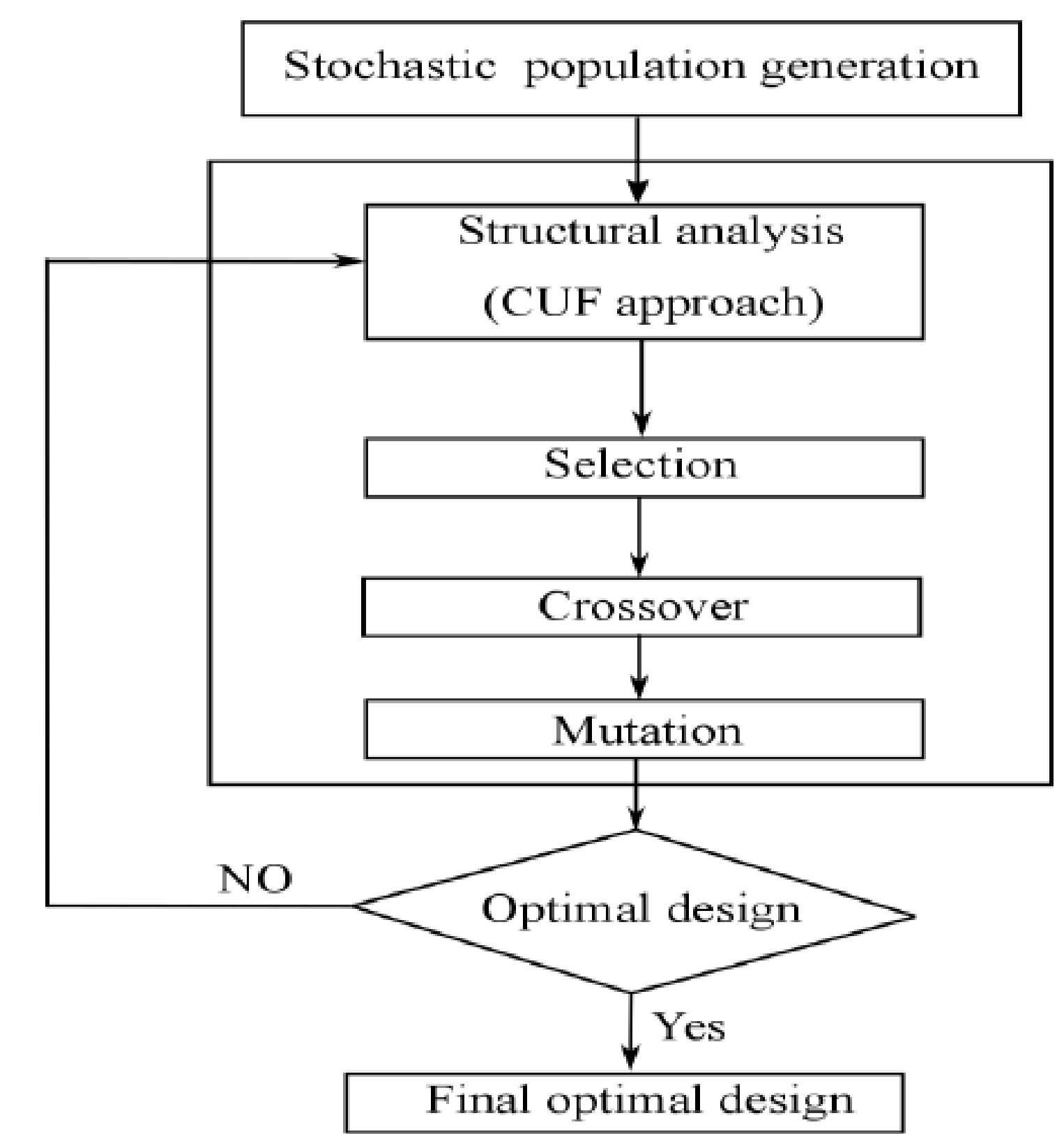
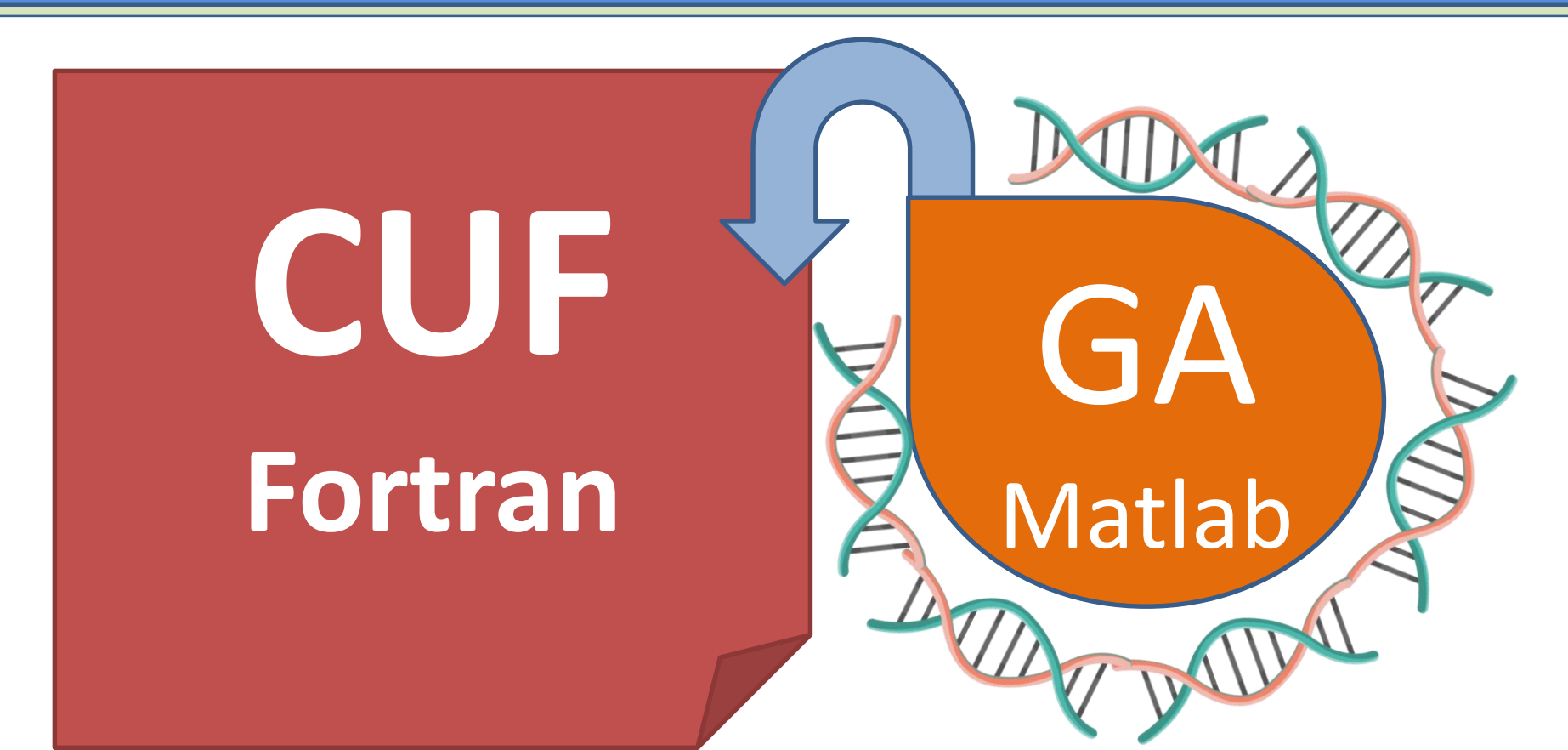


Buckling Analysis



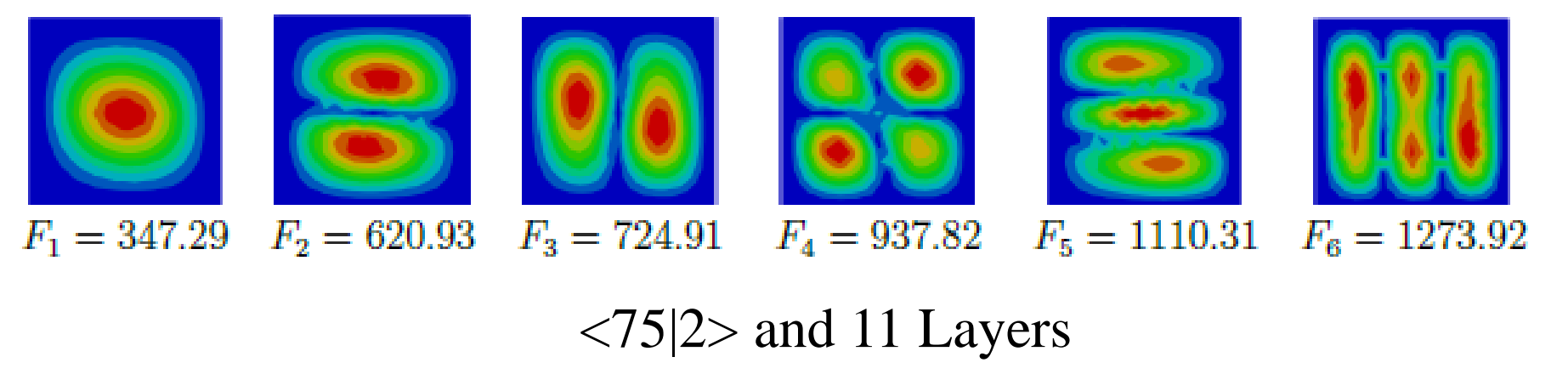
Optimization

Machine Learning



Mass and Fiber orientation Optimization

Free Vibration Analysis



Linear Buckling Analysis

