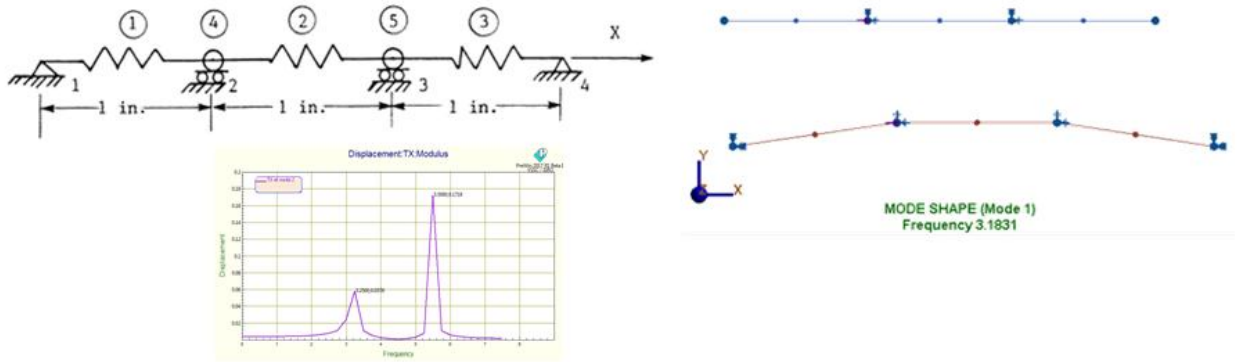


Frequency response analysis of a 2-DOF system



Boundary condition : Zero displacements are prescribed at the end points.

Loading : Harmonic force acting at node 2 of 200 units, in x-direction. Damping is neglected. The response of the system is to be computed for an exciting frequency range of 0.0 to 7.5 Hz at intervals of 0.25 Hz. An eigenvalue analysis using lumped mass formulation and conventional subspace iteration technique is carried out first, from which 2 eigenvalues and eigenvectors are obtained. The frequency response run is performed and displacement response (amplitude and phase lag) is computed.

Material property : Translational mass = $0.5 \text{ lb-sec}^2 / \text{in}$, Translational spring constant = 200 lb/in

Element type : 2-D mass element, 2-D translational spring.

Finite element statistics :

Number of nodes	Number of elements	Degrees of freedom
4	5	2

Output parameters	Theoretical value	FEAST ^{SMT}	NISA2 [®]
Natural frequencies, Hz			
Mode1	3.18	3.18	3.18
Mode2	5.51	5.51	5.51
Displacement response at node # for frequencies in Hz			
1.5Hz at node 2	0.82	0.82	0.82
1.5Hz at node 3	0.46	0.46	0.46
4Hz at node 2	0.51	0.51	0.51
4Hz at node 3	1.21	1.21	1.21
6.5Hz at node 2	0.59	0.59	0.59
6.5Hz at node 3	0.27	0.27	0.27