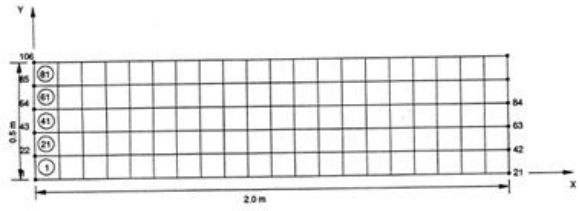
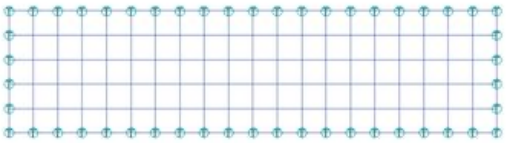
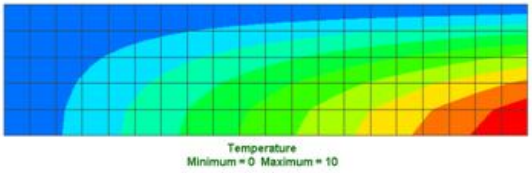
Electric potential distribution inside a void(Analogous field problem)







Material property : Isotropic. K_{XX}, K_{YY} (Dielectric permittivity of air) = $8.854X10^{-12}$(*F/m*)

Element type : 2-D-Four node planar elements. A rectangular void of dimensions (2 m Xlm) in a grounded conductor is biased to a sinusoidal voltage of 10 sin πy. The potential distribution inside the void is computed. Due to the symmetry of the problem, the upper half of the void is considered to be the analysis domain.The calculation domain is modeled with 2D-linear quadratic elements.Nodes on the line x = 2*m* are fixed at voltages given by 10 sin πy and the nodes on lines x = 0 *m*, y = 0.5 and y = 1.0 *m* are kept at 0 volts because of the conductor being grounded. Specifying voltages here is analogous to specifying temperatures in a heat transfer analysis run.

Finite element statistics :

Number of nodes	Number of elements	Degrees of freedom
126	100	76

Output parameters	Theoretical value	FEAST^{SMT}	NISA2®
Potential distribution at node locations			
Node 3 (0.2, 0.5)	0.02	0.02	0.02
Node 18 (1.7, 0.5)	3.89	3.87	3.87
Node 24 (0.2, 0.6)	0.02	0.02	0.02
Node 36 (1.4, 0.6)	1.44	1.42	1.42
Node 46 (0.3, 0.7)	0.03	0.03	0.03
Node 61 (1.8, 0.7)	4.32	4.29	4.29
Node 66 (0.2, 0.8)	0.01	0.01	0.01
Node 82 (1.8, 0.8)	3.14	3.12	3.11
Node 88 (0.3, 0.9)	0.01	0.01	0.01
Node 103 (1.8, 0.9)	1.65	1.64	1.64