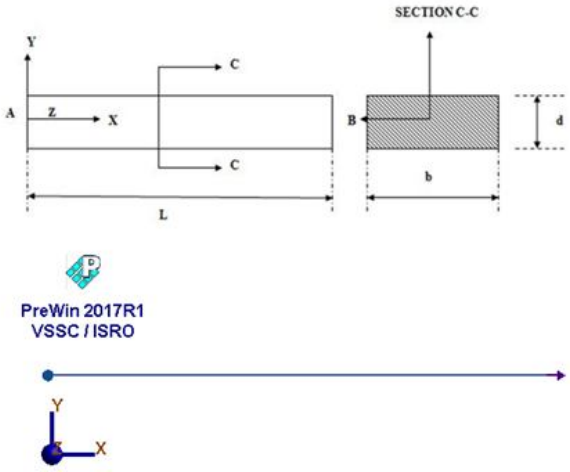
Static analysis of single beam element



	Case 1	Case 2	Case 3	Case 4
Loading :	Point load of 1000 *N* in *x* direction at point B	Point load of 1000 *N* in *y* direction at point B	Moment of 5000 *Nmm* in *z* direction at point B	Point load of 1000 *N* in *y* direction and moment, M_Z = 5000 *Nmm* at point B
Boundary condition :	$U_x = U_y = R_z = 0$ at point A	$U_x = U_y = R_z = 0$ at point A	$U_x = U_y = R_z = 0$ at point A	$U_x = U_y = R_z = 0$ at point A
Geometric property :	L = 100 *mm*, b = 20 *mm*, d = 5 *mm*			
Material property :	E=200 *GPa* , ν = 0.3	E=200 *GPa* , ν = 0.3	E=200 *GPa* , ν = 0.3	E =200 *GPa*, ν = 0.3
Element types :	2D beam element	2D beam element	2D beam element	2D beam element

Finite element statistics :	Number of elements	Number of nodes	Degrees of freedom
	1	2	6(Case 1), 6(Case 2), 6(Case 3), 6(Case 4)

	Case 1	**Case 2**		**Case 3**		**Case 4**	
	Axial Displace-ment *(mm)*	**Transverse Displacement (mm)**	**Rotation (radians)**	**Transverse Displace-ment (mm)**	**Rotation (radians)**	**Transverse Displace-ment (mm)**	**Rotation (radians)**
NAFEMS	0.005	8.00	0.12	0.6	0.012	8.60	0.132
FEAST^{SMT}	0.005	8.01	0.12	0.6	0.012	8.61	0.132
NASTRAN®	0.005	8.02	0.12	0.6	0.012	8.62	0.132