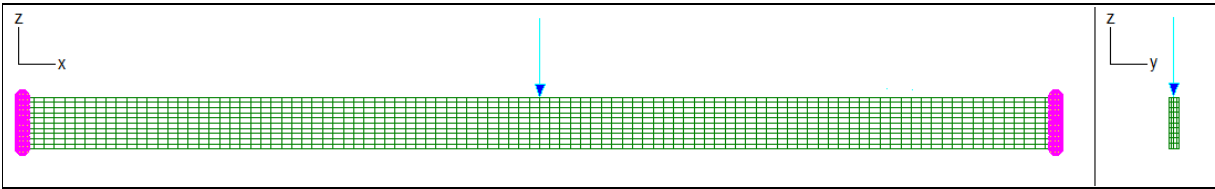


Validation of Sargon Nonlinear solver (CURAN, version 9.70)			
TEST SO028	VALIDATION, CROSS CHECKS, RELIABILITY, BENCHMARK	Marco Croci	Rev.1-28/03/2011



Test description
Constitutive law of solids material: elasto-plastic.
Test model: curanSO_028.WSR , cross-check model: nxS28000.dat (NX Nastran)

Material properties					
Name	ν	ϵ_1	σ_1	ϵ_2	σ_2
S235EP	0,3	0,001119	235N/mm ²	0,007071	360N/mm ²

Beam			Constraints		Load (z direction)	
LENGTH L	HEIGHT h	THICKNESS b	LEFT	RIGHT	APPLICATION POINT	FORCE F
10000mm	500mm	100mm	Fixed	Fixed	Middle point	-1600000N

Model data		
Solid elements	Type	d.o.f.
4000 (100x10x4)	BRICK8WI	16335

CROSS CHECK

Load case	Value	Units	CURAN	NXNASTRAN	% diff.
1	Node 2784 displacement (-z)	mm	-7,619E+01	-7,569E+01	0,65
1	σ_x element 10, node 57 *	N/mm ²	4,109E+02	4,225E+02	-2,73

* With Nastran conventions the corresponding value is Normal Y stress on element 2000010
 NX Nastran output file: nxS28000.f06
 % difference=(CURAN-NXNASTRAN)/NXNASTRAN*100
 Precision of limit multiplier for the analysis: 0.01
 BRICK8WI: isoparametric element with Wilson-Ibrahimbegovic modification