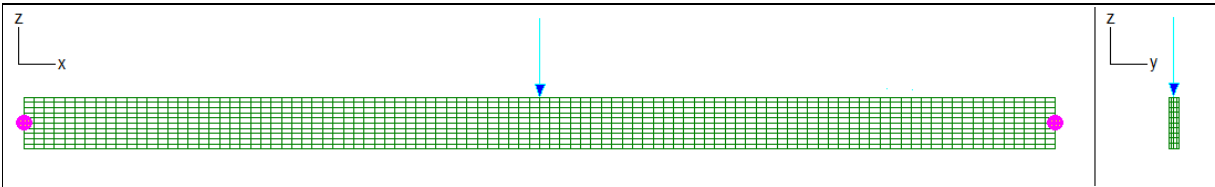


Validation of Sargon Nonlinear solver (CURAN, version 9.70)			
TEST SO030	VALIDATION, CROSS CHECKS, RELIABILITY, BENCHMARK	Marco Croci	Rev.1-28/03/2011



Test description	
Constitutive law of solids material: elasto-plastic.	
Test model: curanSO_030.WSR , cross-check model: nxS30000.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	Simple support	Middle point	-1200000N

Model data		
Solid elements	Type	d.o.f.
4000 (100x10x4)	BRICK8WI	16635

CROSS CHECK					
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Load case	Value	Units	CURAN	NXNASTRAN	% diff.
1	Node 2784 displacement (-z)	mm	-4,595E+02	-4,556E+02	0,86
1	σ_x element 3060, node 2761	N/mm ²	5,844E+02	5,976E+02	-2,21

* With Nastran conventions the corresponding value is Normal Y stress on element 2003060
 NX Nastran output file: nxS30000.f06
 % difference=(CURAN-NXNASTRAN)/NXNASTRAN*100
 Precision of limit multiplier for the analysis: 0.01
 BRICK8WI: isoparametric element with Wilson-Ibrahimbegovic modification