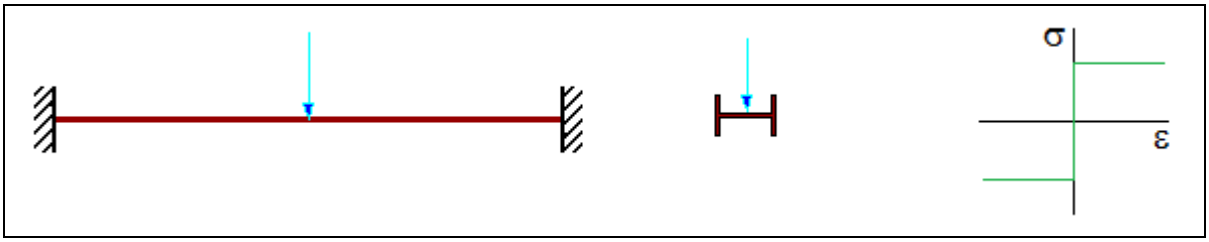
CURAN: BEAMS (HERMITIAN)	TEST 014	rev.1 21/10/13	version 10.70
VALIDATION, CROSS CHECKS, RELIABILITY, BENCHMARK	Tested by: Marco Croci – Checked by: Paolo Rugarli		



MODEL		
MODEL NAME	OUTPUT FILE	ANALYSIS TYPE
curanBE_014.WSR	curanBE_014.cog	nonlinear static (Curan)

DATA			
L [mm]	**P [N]**	**σ_y [N/mm^2]**	**W_{pl} [mm^3]**
5000	500000	235	207000

THEORETICAL COMPUTATION

Cross section maximum bending moment is equal to

$$M_{pl} = W_{pl} \cdot \sigma_y = 4.865E+07 Nmm$$

and occurs when a force equal to P_{lim} is applied:

$$P_{\lim} = \frac{8M_{pl}}{L} = 77832N < P$$

Since the applied load exceeds the limit load, a load multiplier is computed:

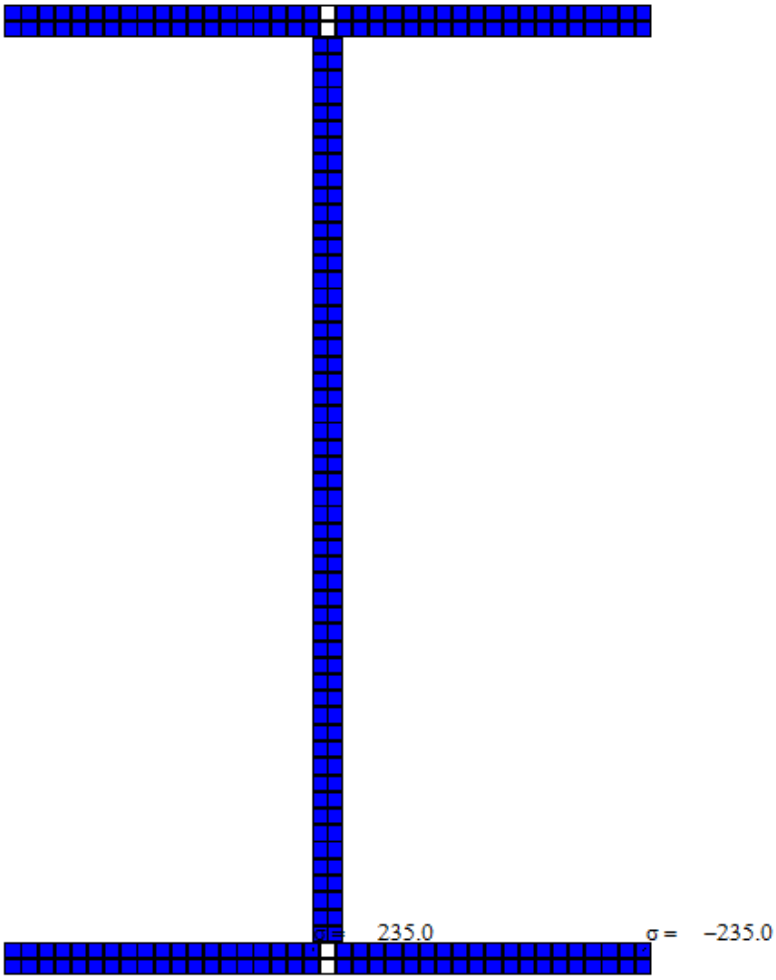
$$\frac{P_{\lim}}{P} = 0.1557$$

CROSS-CHECK

Value	Theory	Sargon	% difference (S-T)/T*100
Load multiplier	0.1557	0.1552	-0.3

NOTES
- force is parallel to flange (weak axis bending).
- shear area: not considered.
- Analysis parameters: Lobatto's points: 5. Fibers number: 250
- Mesh is more refined at midspan and constraints, where 300mm of the member are divided into 10 elements (on both sides at midspan)

NONLINEAR FIBER MODEL ANALYSIS RESULTS - NORMAL STRESS
Beam #1 Lobatto's section #1 (csi = -1.000) Lcase = 1 / 1
Sigma, max= 235.0 N/mm²; Sigma, min= -235.0 N/mm²;



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