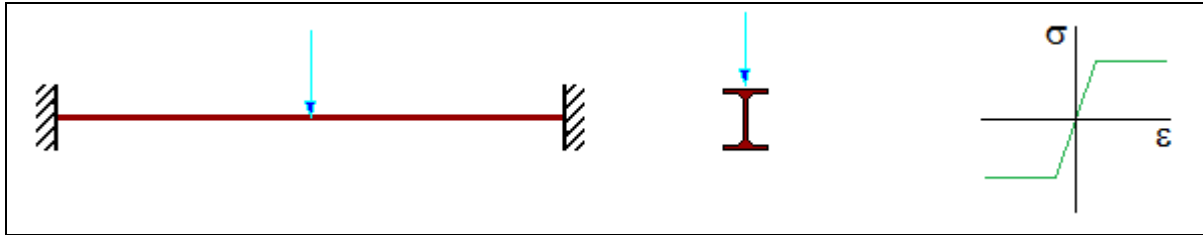


<b>CURAN: BEAMS (HERMITIAN)</b>	TEST 029	rev.1 21/10/13	version 10.70
VALIDATION, CROSS CHECKS, RELIABILITY, BENCHMARK	Tested by: Marco Croci - Checked by: Paolo Rugarli		



MODEL		
MODEL NAME	OUTPUT FILE	ANALYSIS TYPE
curanBE_029.WSR	curanBE_029.cog	nonlinear static (Curan)

DATA				
L [mm]	P [N]	E [N/mm <sup>2</sup> ]	$\sigma_y$ [N/mm <sup>2</sup> ]	$W_{pl}$ [mm <sup>3</sup> ]
5000	500000	210000	235	822537

THEORETICAL COMPUTATION
<p>Cross section maximum bending moment is equal to</p> $M_{pl} = W_{pl} \cdot \sigma_y = 1.933E+08 Nmm$ <p>and occurs when a force equal to <math>P_{lim}</math> is applied:</p> $P_{lim} = \frac{8M_{pl}}{L} = 309274 N < P$ <p>Since the applied load exceeds the limit load, a load multiplier is computed:</p> $\frac{P_{lim}}{P} = 0.6185$

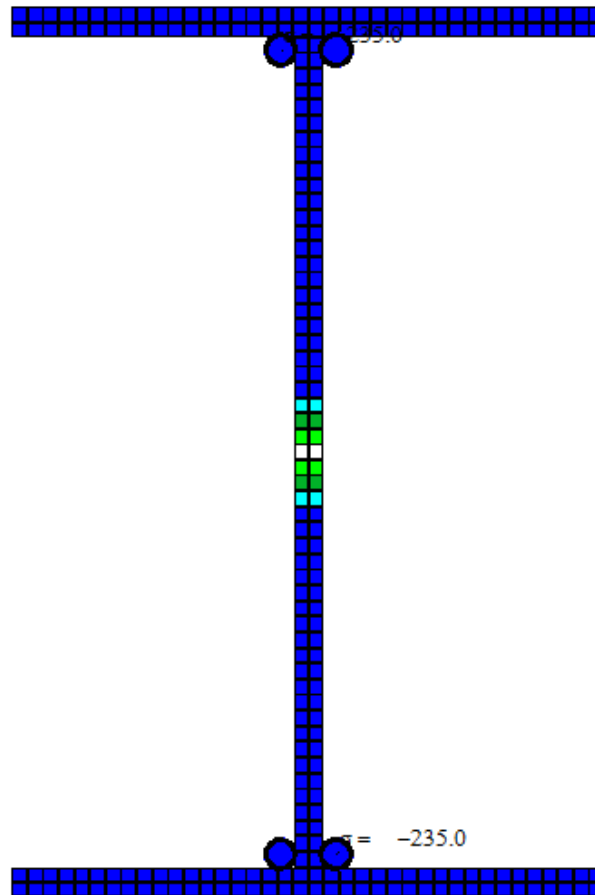
CROSS-CHECK
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Value	<u>Theory</u>	<u>Sargon</u>	% difference (S-T)/T*100
Load multiplier	0.6185	0.6202	0.27

NOTES

- force is parallel to web (strong axis bending).
- shear area: not considered.
- Analysis parameters: Lobatto 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/mm<sup>2</sup>; Sigma, min= -235.0 N/mm<sup>2</sup>;



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