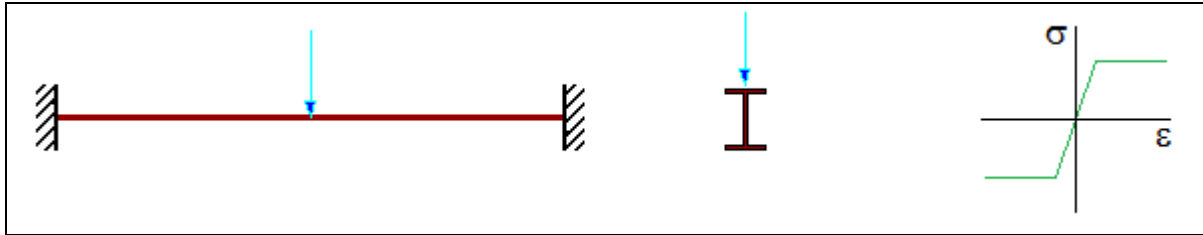


CURAN: BEAMS (HERMITIAN)	TEST 005	rev.1 21/10/13	version 10.70
VALIDATION, CROSS CHECKS, RELIABILITY, BENCHMARK	Tested by: Marco Croci - Checked by: Paolo Rugarli		



MODEL		
MODEL NAME	OUTPUT FILE	ANALYSIS TYPE
curanBE_005.WSR	curanBE_005.cog	nonlinear static (Curan)

DATA				
L [mm]	P [N]	E [N/mm ²]	σ _y [N/mm ²]	W _{pl} [mm ³]
5000	500000	210000	235	776000

THEORETICAL COMPUTATION
<p>Cross section maximum bending moment is equal to</p> $M_{pl} = W_{pl} \cdot \sigma_y = 1.824E+08 Nmm$ <p>and occurs when a force equal to P_{lim} is applied:</p> $P_{lim} = \frac{8M_{pl}}{L} = 291776N < P$ <p>Since the applied load exceeds the limit load, a load multiplier is computed:</p> $\frac{P_{lim}}{P} = 0.5836$

CROSS-CHECK

Value	<u>Theory</u>	<u>Sargon</u>	% difference (S-T)/T*100
Load multiplier	0.5836	0.5839	0.1

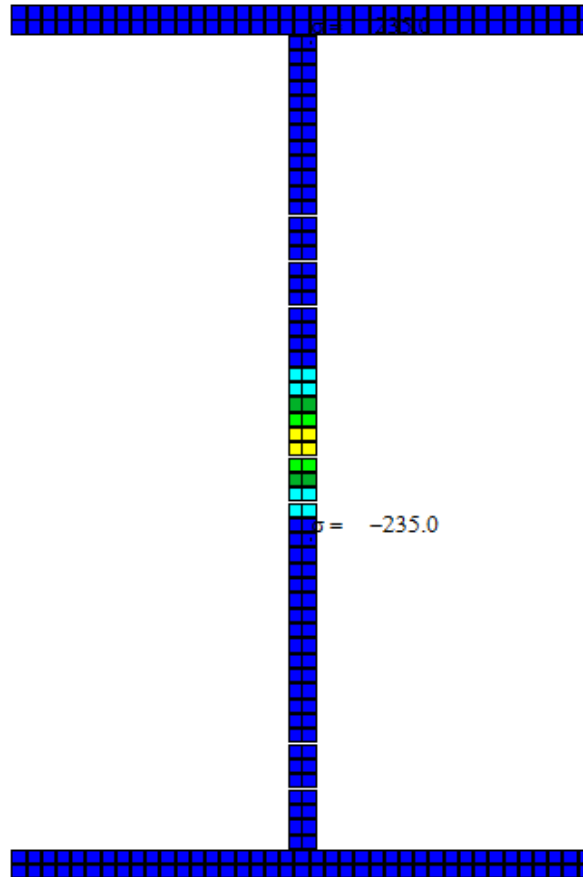
NOTES

- 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/mm²; Sigma, min= -235.0 N/mm²;



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