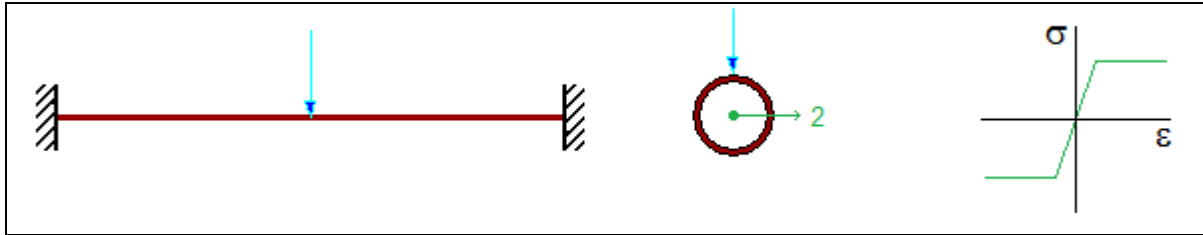


CURAN: BEAMS (HERMITIAN)	TEST 017	rev.1 21/10/13	version 10.70
VALIDATION, CROSS CHECKS, RELIABILITY, BENCHMARK	Tested by: Marco Croci - Checked by: Paolo Rugarli		



MODEL		
MODEL NAME	OUTPUT FILE	ANALYSIS TYPE
curanBE_017.WSR	curanBE_017.cog	nonlinear static (Curan)

DATA				
L [mm]	P [N]	E [N/mm ²]	σ_y [N/mm ²]	W_{pl} [mm ³]
1000	3000	210000	235	1045.3

THEORETICAL COMPUTATION
<p>Cross section maximum bending moment is equal to</p> $M_{pl} = W_{pl} \cdot \sigma_y = 2.457E+05 Nmm$ <p>and occurs when a force equal to P_{lim} is applied:</p> $P_{lim} = \frac{8M_{pl}}{L} = 1965 N < P$ <p>Since the applied load exceeds the limit load, a load multiplier is computed:</p> $\frac{P_{lim}}{P} = 0.6551$

CROSS-CHECK

Value	<u>T</u> heory	<u>S</u> argon	% difference (S-T)/T*100
Load multiplier	0.6551	0.6543	-0.1

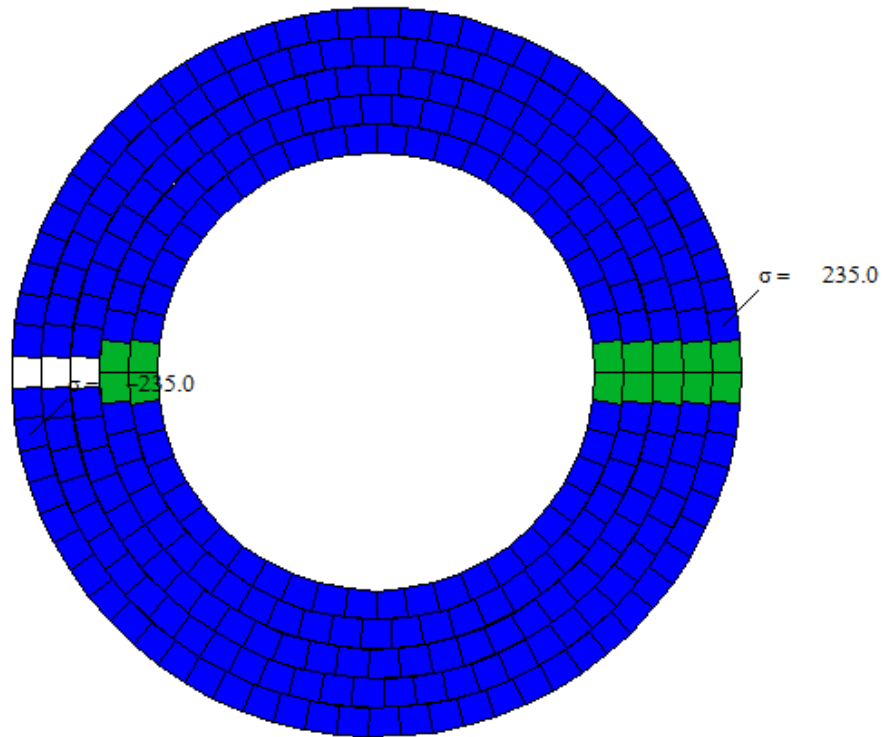
NOTES

- force is parallel to cross-section axis 3.
- shear area: not considered.
- Analysis parameters: Lobatto's points: 5. Fibers number: 250
- Mesh is more refined at midspan and constraints, where 50mm of the member are divided into 20 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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