Shahid Beheshty University

Department of Mechanical and Energy Engineering

An Introduction to Finite Element Method (FEM)

Assignment # 3

Subject: Beam Element

MATLAB and ABAQUS Results Comparison

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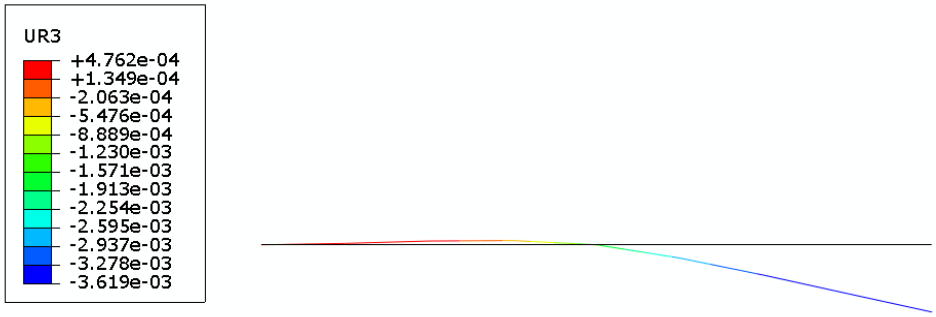
Problem 4.21

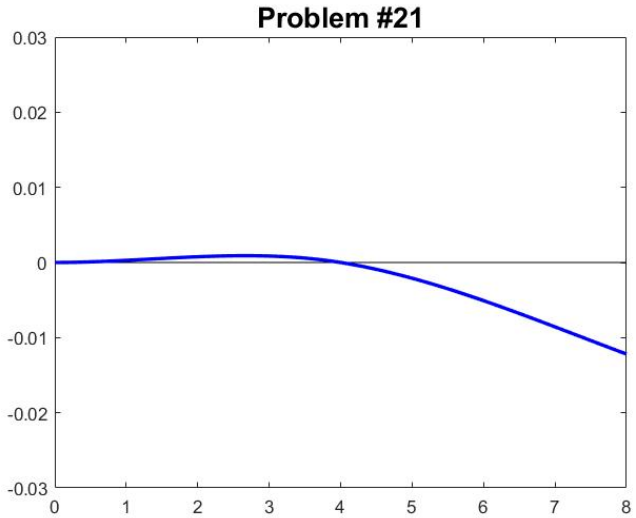
4.21-1 deflection Comparison

Node	Parameter	MATLAB Results (m)	ABAQUS Results (m)	Difference
1	U2	0	12E-33	-1.20E-32
2	U2	0	28E-33	-2.80E-32
3	U2	-0.0121904761904762	-0.0134616	0.00127

4.21-2 Slope of beams

Node	Parameter	MATLAB Results (Pa)	ABAQUS Results (Pa)	Difference
1	S11	0	16.0000E-33	-1.60E-32
2	S11	-0.00152380952380952	-0.00152381	4.76E-10
3	S11	-0.00355555555555556	0.00361905	-7.17E-03





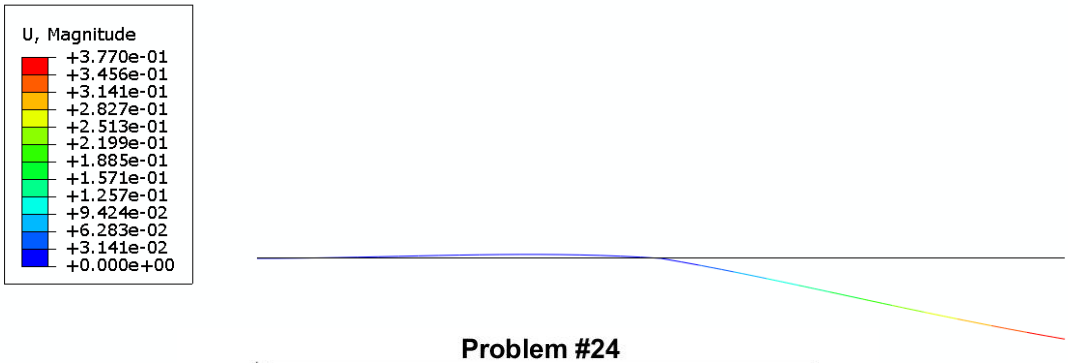
Problem 4.24

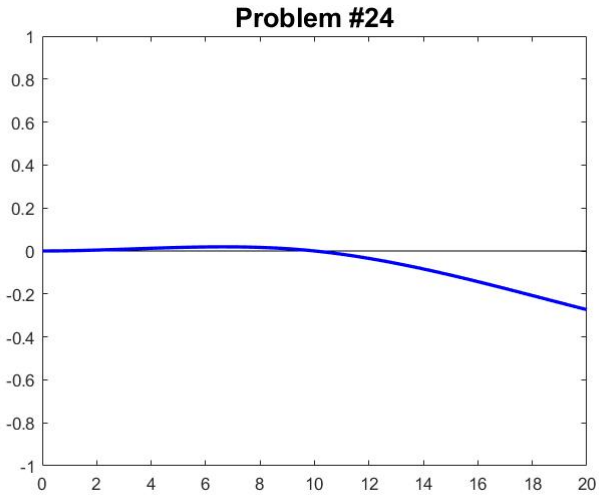
4.24-1 deflection Comparison

Node	Parameter	MATLAB Results (m)	ABAQUS Results (m)	Difference
1	U2	0	20.5021E-33	20.5021E-33
2	U2	0	-60.0021E-33	-60.0021E-33
3	U2	-0.273103437241380	-0.376970	0.103866563

4.24-2 Slope of beams

Node	Parameter	MATLAB Results (Pa)	ABAQUS Results (Pa)	Difference
1	S11	0	71.6469E-33	-7.16E-32
2	S11	-0.0129655166896552	-0.0129689	3.38E-06
3	S11	-0.0322758604137931	-0.0323032	2.73E-05





Problem 4.28

4.28-1 deflection Comparison

Node	Parameter	MATLAB Results (m)	ABAQUS Results (m)	Difference
1	U2	0	-4.87500E-33	4.87500E-33
2	U2	0	-58.3125E-33	58.3125E-33
3	U2	0	-24.5625E-33	24.5625E-33

4.28-2 Slope of beams

Node	Parameter	MATLAB Results (Pa)	ABAQUS Results (Pa)	Difference
1	S11	0.000312500000000000	312.500E-06	0
2	S11	-0.0018750000000000	-1.87500E-03	0
3	S11	0.00343750000000000	3.43750E-03	0