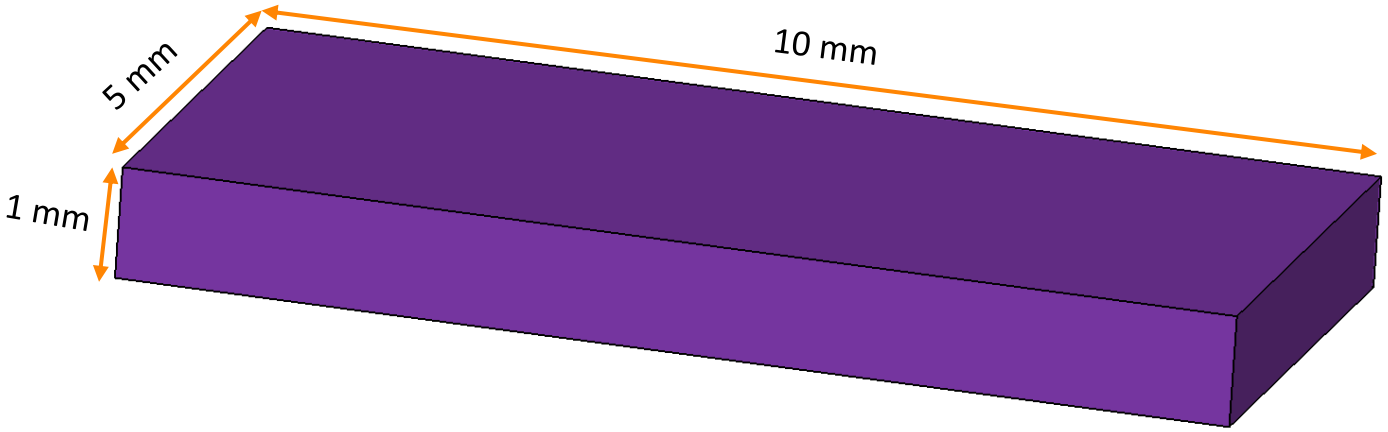
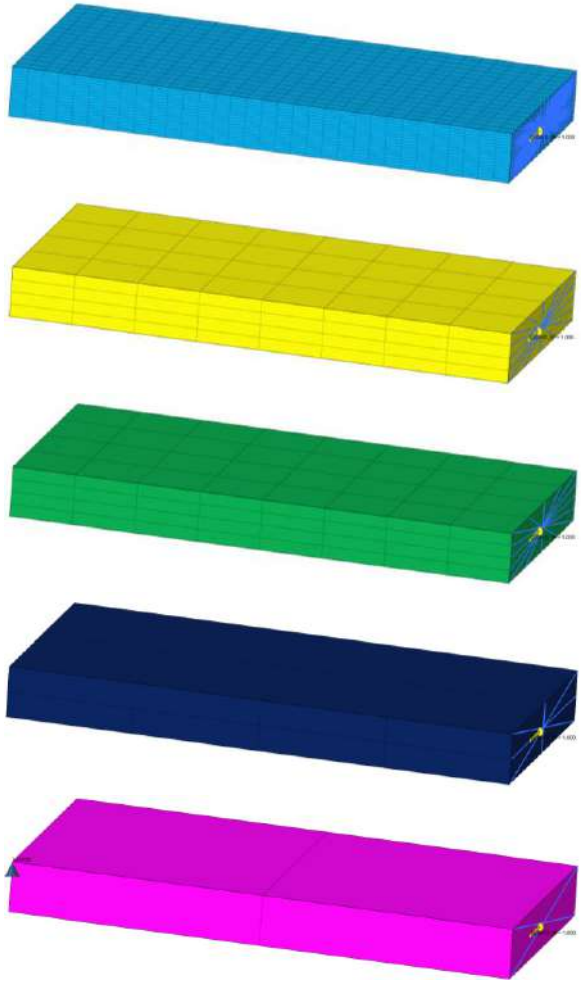
Elastic Bending

For questions fill out contact form

Model Description

- Elastic bending of a metal plate was performed to show the dependence of convergence on number of elements and element formulations.
- Aspect ratio 5:1 kept constant.
- Implicit Analysis





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Model Parameters

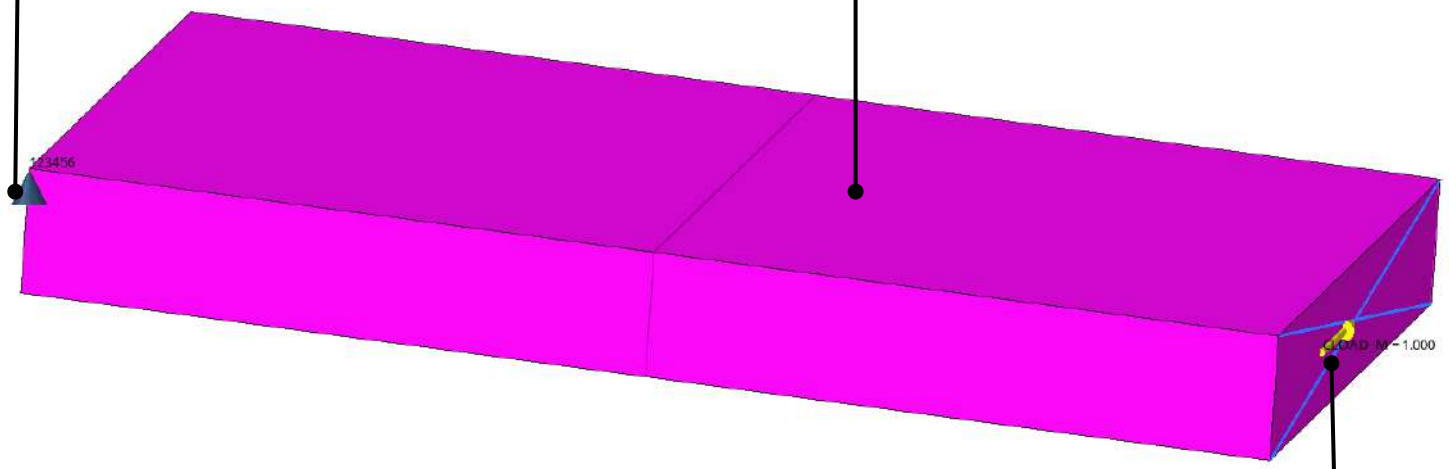
Entity	Type
Solver	Altair Radioss
Version	2022.1
Processors	2
Threads	2
CPU	Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz
Total run time	

FEA Entities	Type
Analysis Type	Dynamic Explicit
Unit System	kg, mm, ms
Element Type	P14_SOLID
Material Type	M1_ELAST

Analysis Setup

Steel Specimen
- Solid elements
- Elastic material

Fixed End



Applied torque
- 1 Nm

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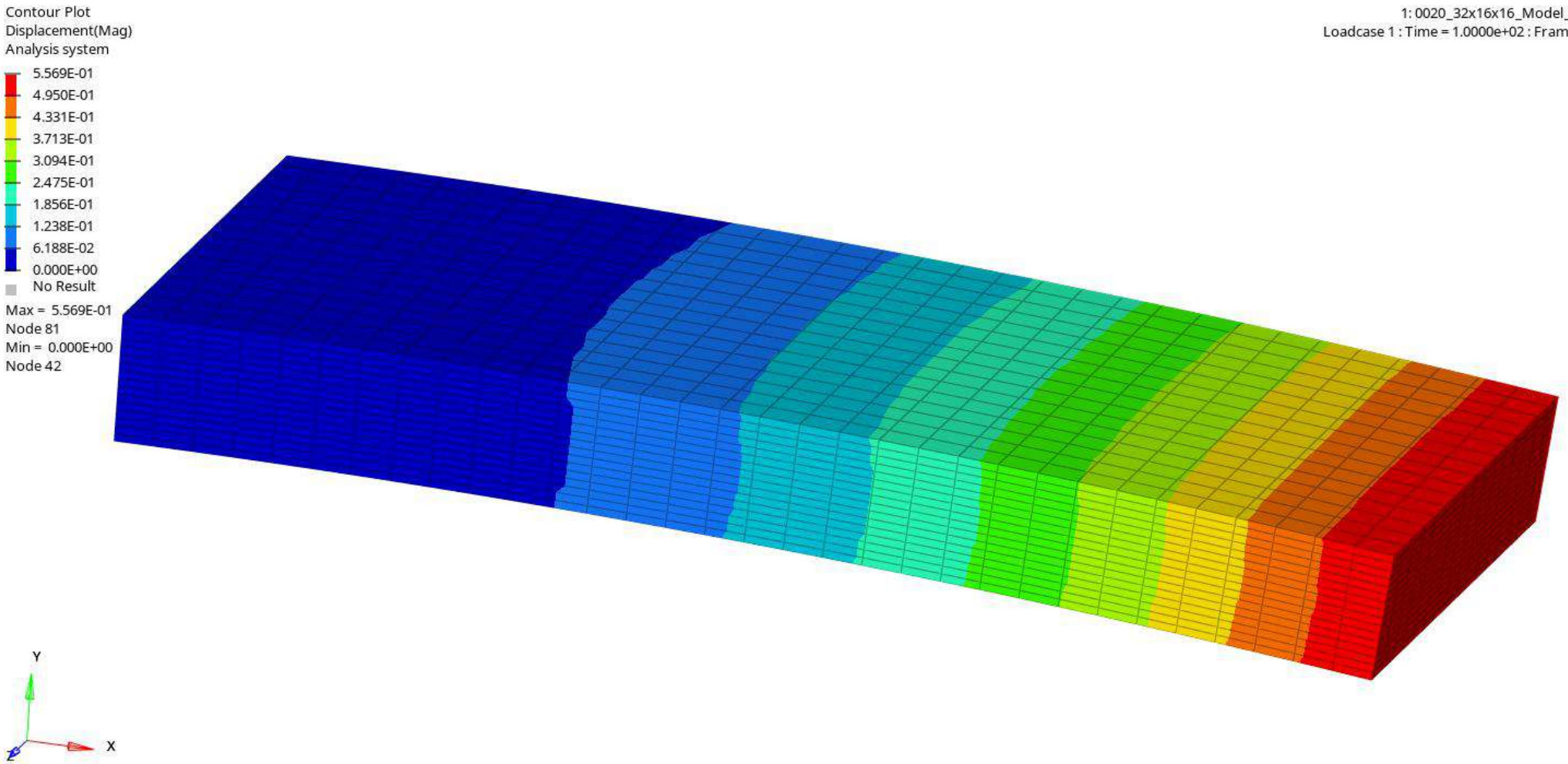
Analysis Assumptions and Limitations

Analysis Results



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Analysis Results

- Analytical solution for end tip deflection = 0.57143 mm

Discretization	Solid element type 1	Solid element type 2	Solid element type 14	Solid element type 17	Solid element type 18	Solid element type 24
2 x 1 x 1	0.0567 (90.09%)	0.0567 (90.09%)	0.5614 (1.75%)	0.0567 (90.09%)	0.0525 (90.83%)	0.5614 (1.75%)
4 x 2 x 2	0.1708 (70.12%)	0.1708 (70.12%)	0.5454 (4.55%)	0.1708 (70.12%)	0.1614 (71.77%)	0.5454 (4.55%)
8 x 4 x 4	0.3517 (38.46%)	0.3517 (38.46%)	0.5508 (3.61%)	0.3517 (38.46%)	0.3420 (90.09%)	0.5508 (3.61%)
16 x 8 x 8	0.4849 (15.14%)	0.4849 (15.14%)	0.5549 (2.89%)	0.4849 (15.14%)	0.4801 (15.98%)	0.5549 (2.89%)
32 x 16 x 16	0.5374 (5.95%)	0.5374 (5.95%)	0.5569 (2.54%)	0.5374 (5.95%)	0.5357 (6.25%)	0.5569 (2.54%)

Conclusions

- Elastic bending analysis of a beam was conducted to show the dependance of convergence on number of elements and element formulations.