

FEA of PLUME ladder

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AID Layout

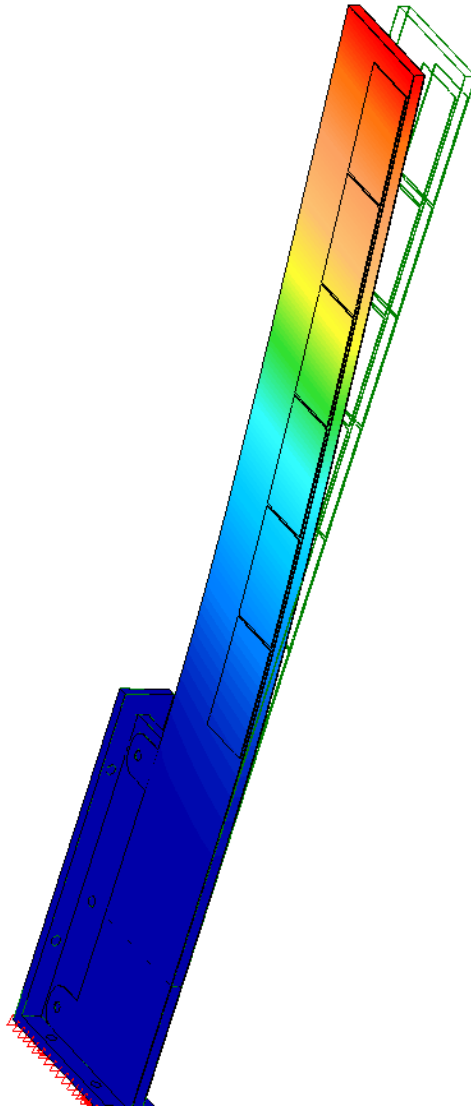
- Four stations with precise adjustable stages
 - Two overlapping ladders in each station
 - Middle station with three additional degrees of freedom
- Conceptual drawing:



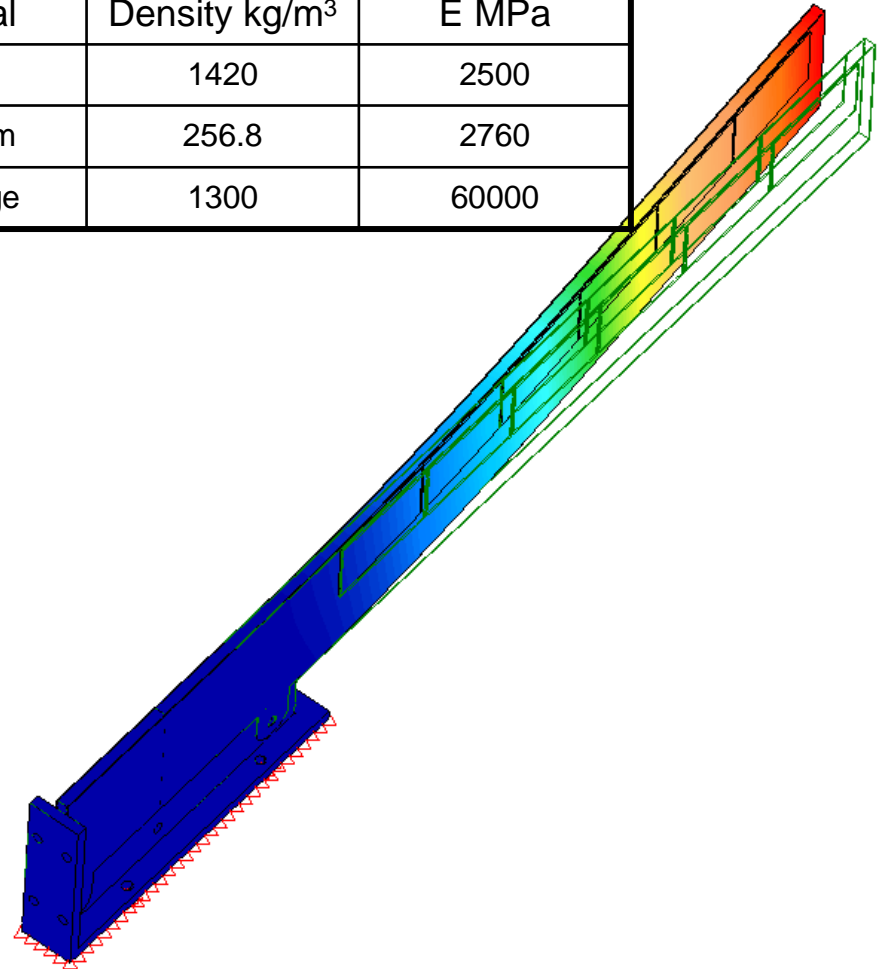
PLUME ladder FEA: Modal Analysis

Impute data:

Material	Density kg/m ³	E MPa
Kapton	1420	2500
SiC foam	256.8	2760
CF flange	1300	60000



Mode: 1 of 5
Frequency: 55.3532 /s



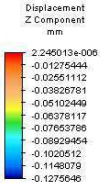
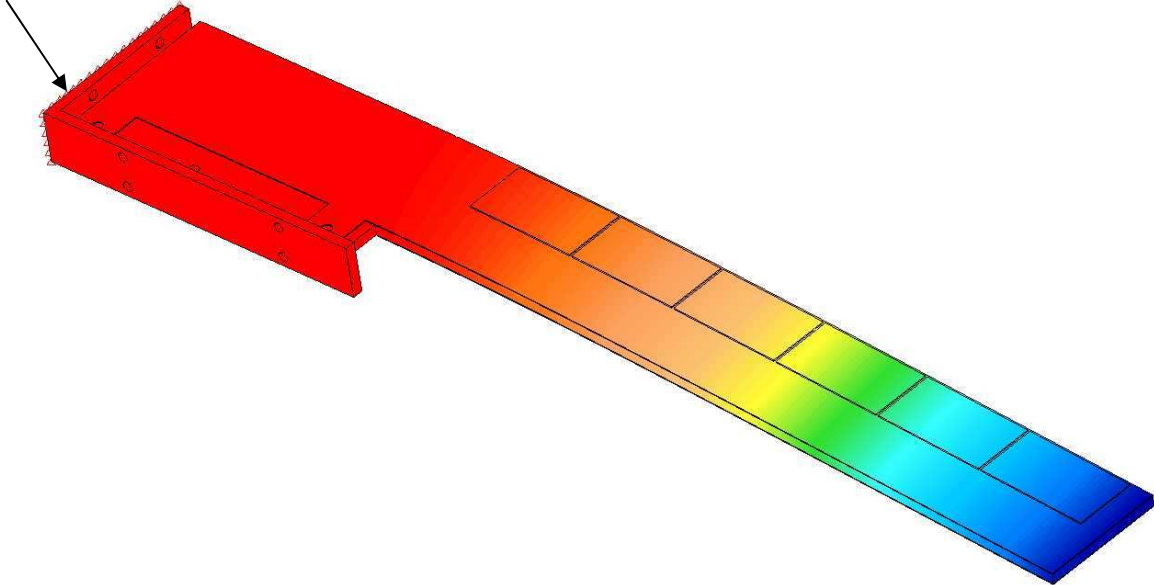
Mode: 1 of 5
Frequency: 56.5199 /s

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PLUME ladder FEA: Static Analysis

Under gravity load in Z dir: max Z deflection is 0.127mm

Fully fixed on this face



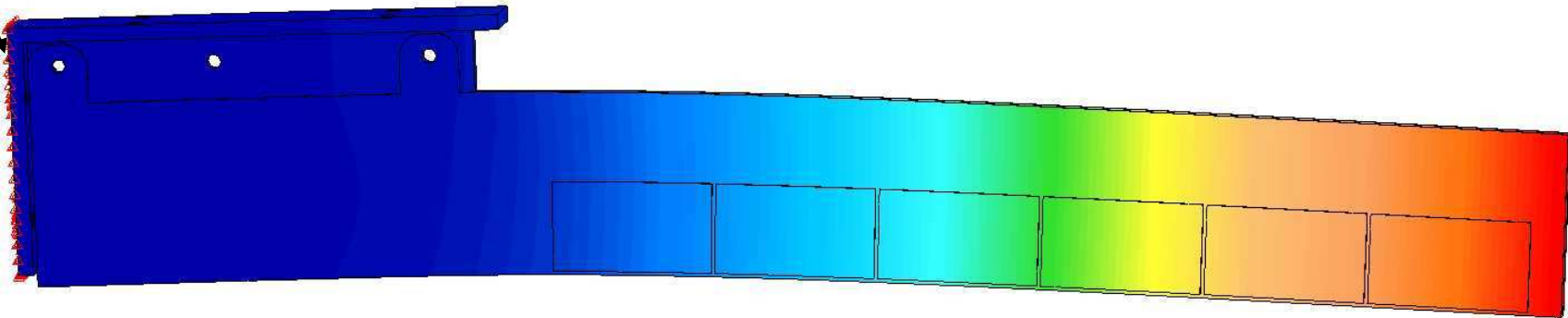
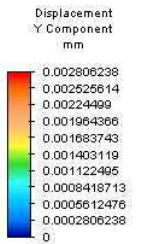
Load Case: 1 of 1
Maximum Value: 2.24501e-006 mm
Minimum Value: -0.127565 mm



PLUME ladder FEA: Static Analysis

Under gravity load in Y dir: max Y deflection is 0.003mm

Fully fixed on this face



Load Case: 1 of 1

Maximum Value: 0.00280624 mm

Minimum Value: 0 mm



PLUME ladder FEA: Static Analysis

When the ladder is placed in 45 deg position: max deflection is 0.09mm mainly in Z direction

