

## **Upper-Intermediate Mass for the ETM Controls Prototype Quad Pendulum Suspension**

### **DESIGN BRIEF**

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Revision 00: First revision of the brief.

The purpose of the Upper-Intermediate Mass (U-I Mass) is to:

- Act as the second mass from top in a quadruple pendulum suspension chain.
- Support a Penultimate mass and Test mass/Mirror
- Provide an interface with the bottom blades (cantilever springs)<sup>1</sup>
- Provide an interface with the upper-intermediate wires coming from the middle blades.
- Have ability to be configured for both the main and reaction chains.
- Incorporate global control that acts between the main and reaction U-I masses, for alignment of the suspension in Pitch, Yaw and Longitudinal directions
- Perform its function with geometry, mass and moment of inertia parameters that fall within the limits set by the MATLAB Quad Suspension model.

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<sup>1</sup> The blade springs act as an interface for the wires going to the Penultimate Mass and help minimise the effects of vertical seismic noise on the suspension system.