E-TEST Seismic Isolation Update

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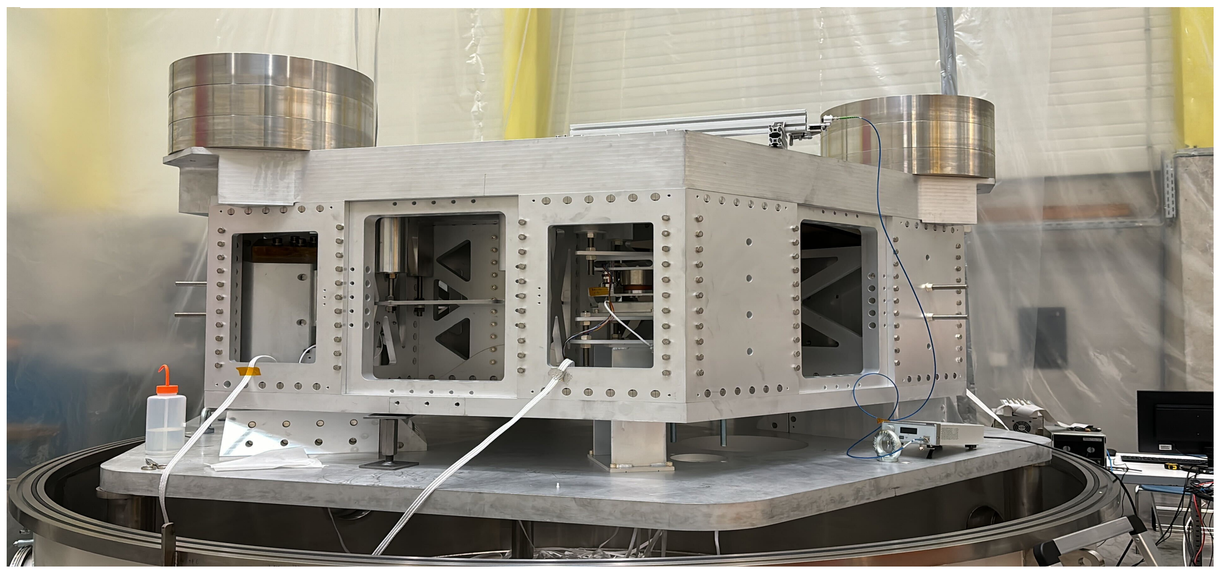
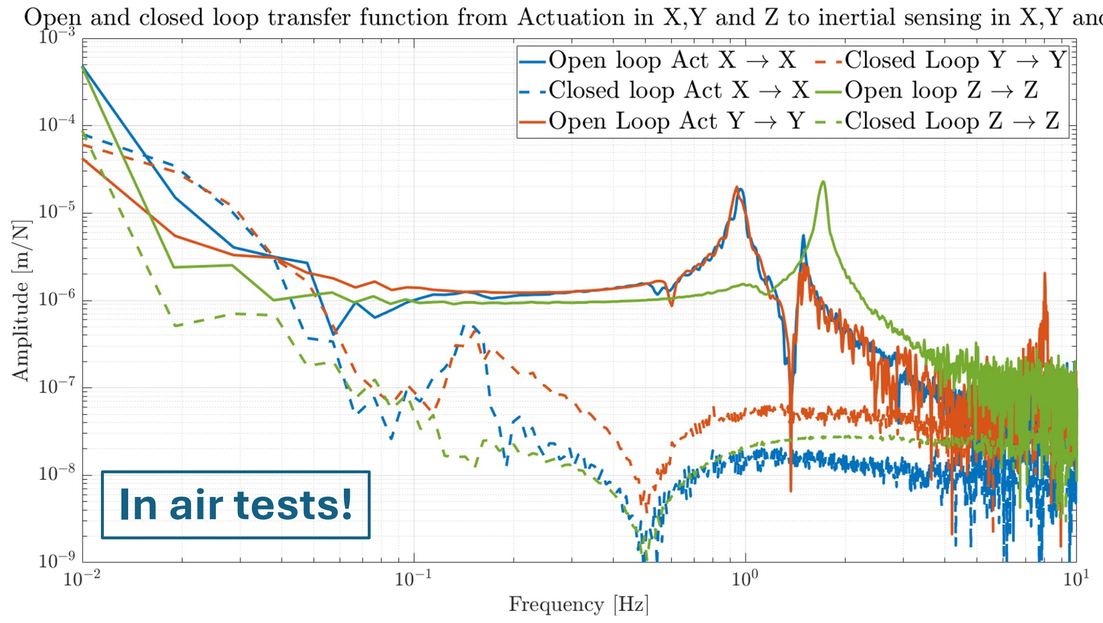
Context

The E-TEST prototype is a facility for the Einstein Telescope. It serves as a unique full-scale test bench designed to suspend a 100 kg test mass, cooled down to cryogenic temperatures through radiative cooling, and isolated using an inverted pendulum mounted on an active platform. This combination of passive and active isolation allows to obtain a compact suspension capable of achieving low-frequency seismic isolation (< 10 Hz). Furthermore, cryogenic sensors are installed in the penultimate stage to monitor vibrational motion.

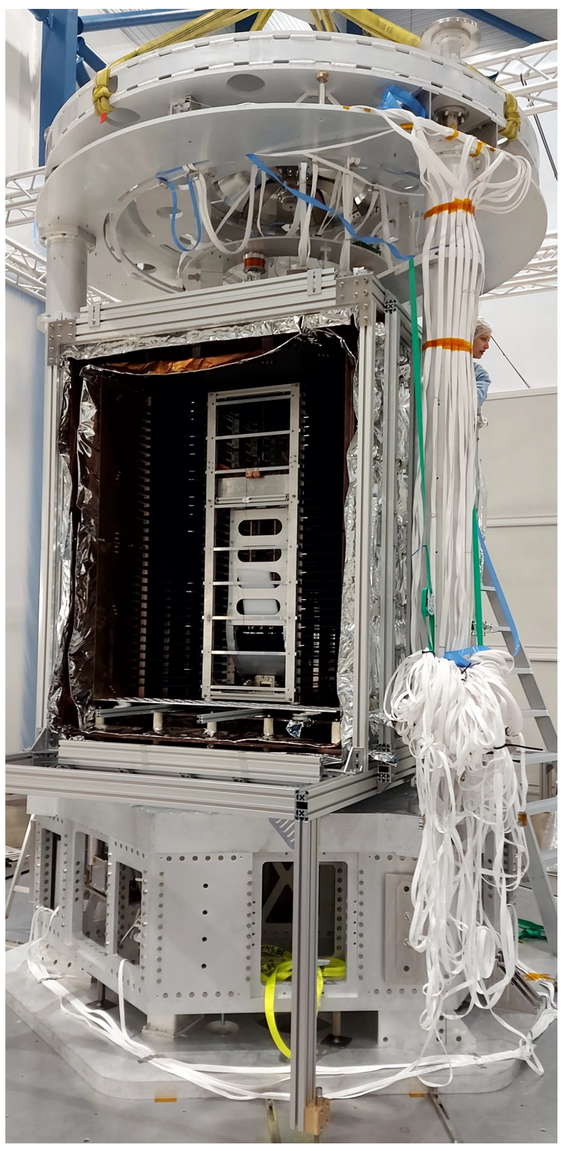
Active Isolation Platform

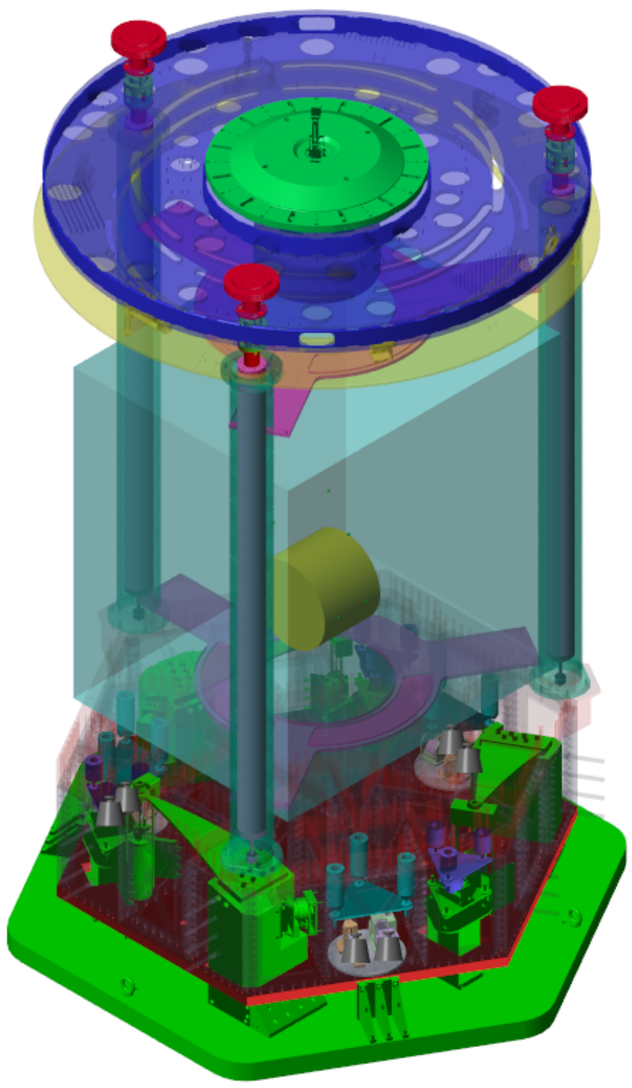


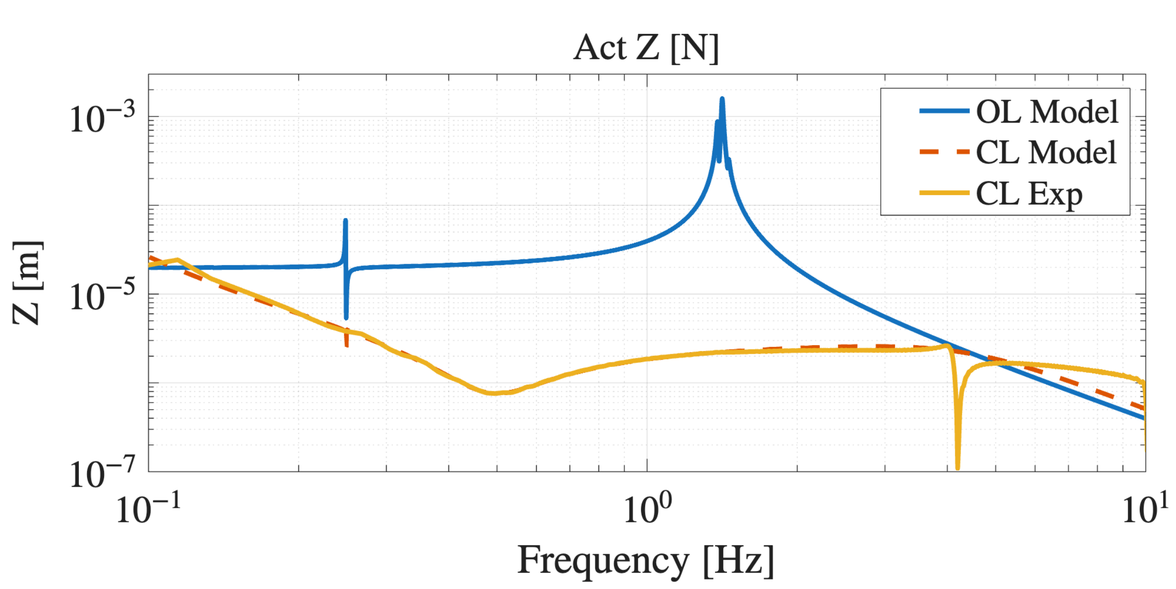


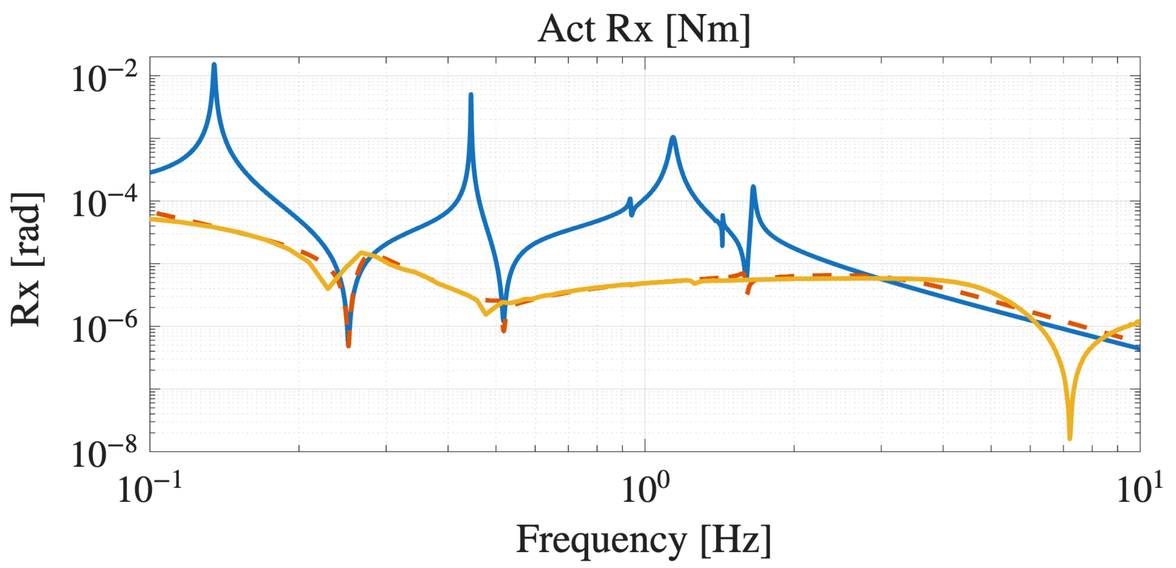
Full Prototype Vacuum Tests

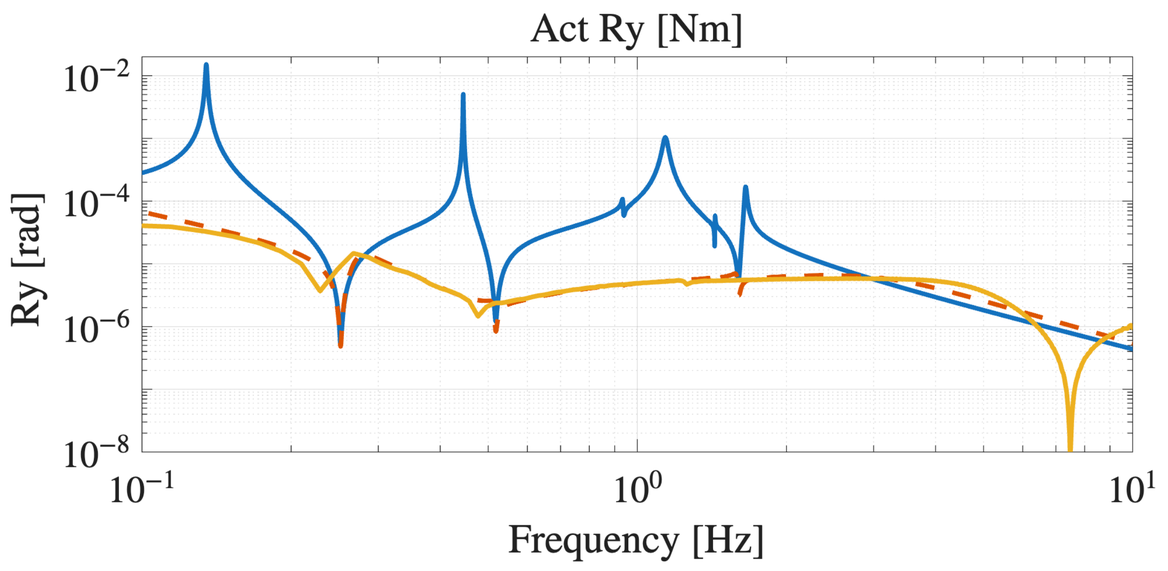
1. Plant Identification → 2. Model Update → 3. Model-Based Controller Design → 4. Experimental Validation



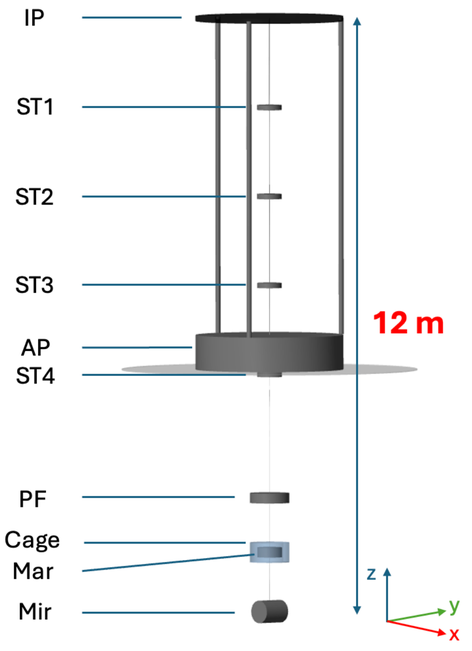


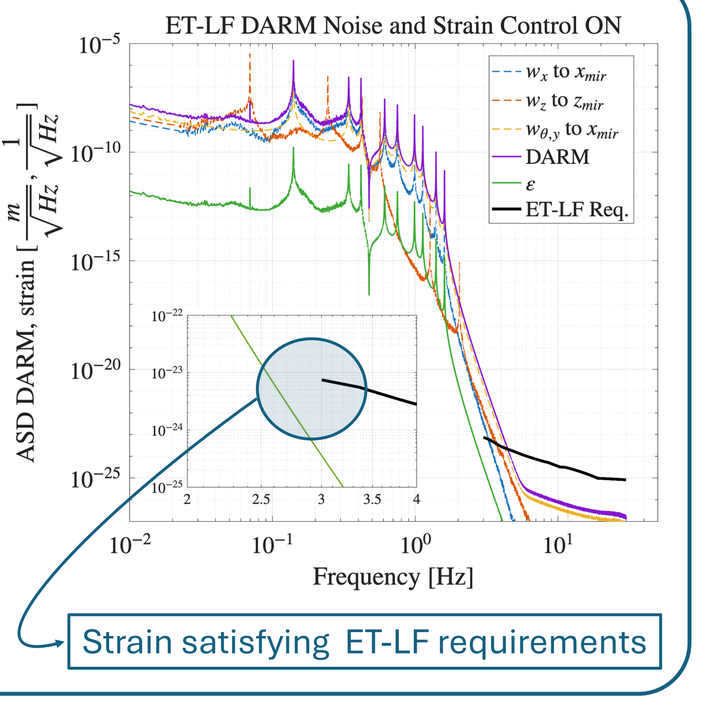






From E-TEST to ET





Strain satisfying ET-LF requirements

E-TEST
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Precision Mechatronics Laboratory