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E-TEST Seismic Isolation Update

This talk will present the latest achievements in active seismic isolation on the E-TEST prototype. 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. The talk will begin with an overview of the E-TEST objectives and the control-oriented roadmap. It will then address the general strategies adopted for seismic isolation, including techniques for decoupling in different directions, with each step supported by a correlation between the model and experimental data at the active platform level. This approach allows to analyse and identify the limitations of the decoupling, with the aim of enhancing overall performance. To conclude, on/off control measurements will be presented using the cryogenic sensors as witness sensors.

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