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## **A Systems Approach to Evaluating the Status of ET-LF Seismic Attenuation Proposals**

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The Einstein Telescope low-frequency (ET-LF) interferometers will extend the detection band for gravitational-waves down to 3 Hz. Significant design decisions, such as an underground infrastructure, have already been taken. With the instrument proposal due in the mid-2020's other design decisions are under active deliberation.

Critical to achieving the displacement sensitivity of ET-LF is the seismic attenuation system. Among the design requirements this subsystem needs to satisfy are seismic isolation, and avoiding reinjection of 'technical noise'. Controls and technical noises limit the low-frequency performance of some current detectors, and no demonstrated design satisfies the ET-LF length displacement requirements.

We compare different seismic attenuation proposals, from a systems perspective, focusing on length control. Implications for 'technical noises'; alignment control; and payload actuation are calculated, and included. The resulting displacement spectra of the test mass mirrors are contrasted with each other, and the ET-LF design requirements. We address if proposed seismic attenuation systems satisfy the length displacement requirements of the ET-LF design.

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