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AEI 10m Prototype - Recent developments towards the Sub-SQL Interferometer

As gravitational wave detectors continue to advance, enhancing their sensitivity remains a crucial challenge. Performance is limited by various noise sources, including seismic, thermal, and quantum noise. Developing techniques to mitigate these limitations is essential for the development of the Einstein Telescope interferometers.

The AEI 10m Prototype is a prototyping facility closely resembling a gravitational wave detector. The facility serves as a unique testbed for new advanced technologies as it will operate a Fabry-Perot Michelson interferometer designed to be nominally limited by the Standard Quantum Limit (SQL) where quantum radiation pressure noise and shot noise intersect. Additionally, the ultra-low noise environment makes it ideal for testing other technologies such as inertial sensors and control techniques.

An update on the progress and recent developments will be presented. Some of the topics discussed will include current progress towards setting up the so-called Sub-SQL Interferometer, the improvement of the input beam with an additional Input Mode Cleaner and the preparation of the quasi-monolithic suspensions.

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