

# Research & Development of novel position sensors and actuators for seismic attenuation systems of ETpathfinder

*Tuesday, 24 October 2023 10:00 (15 minutes)*

The precise monitoring and active damping of seismic noise are paramount in gravitational wave (GW) detectors. This presentation outlines our research focused on the application of Linear Variable Differential Transformers (LVDTs) as position sensors in these detectors. LVDTs, based on mutual induction, offer a non-contact, linear response.

A simulation framework has been developed using pyFEMM, a Python extension for finite element method magnetics, to model and simulate various LVDT designs.

Initial coil production for ETpathfinder has been setup including the creation of a comprehensive checklist for machine settings and procedures. Comprehensive tests have been conducted to evaluate coil performance, including sensitivity, impedance, force measurements, and noise analysis. These tests provide insights into the efficiency of produced LVDTs, including their linear and non-linear movement ranges and response characteristics.

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**Session Classification:** Instrumentation

**Track Classification:** Instrumentation and R&D