

Active Seismic Isolation with an Inertial Rotation Sensor

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Active seismic isolation is indispensable for terrestrial gravitational wave observatories. Current systems utilize a variety of sensors and actuators to sense and control the motion of the isolated platform in all six degrees-of-freedom. To date, the inertial rotation sensing has been achieved utilizing the difference of displaced pairs of translational seismometers. We describe the implementation of a beam-balance based inertial rotation sensor on a dual-stage active isolation platform. This sensor achieves out-of-loop noise **XX** times lower than the existing sensors at **XX** Hz. With this sensor implemented within the table's control systems, the table's motion is decreased by **XX** compared to the seismometer-only implementation.

I. INTRODUCTION

II. INSTRUMENT

Sensor
ISI description

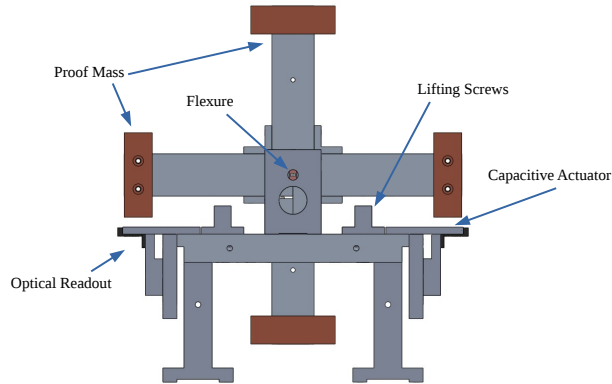


FIG. 1.

III. OUT-OF-LOOP MEASUREMENTS

Noise measurement

Transfer functions

IV. IN-LOOP PERFORMANCE

Blends

Performance

V. CONCLUSION

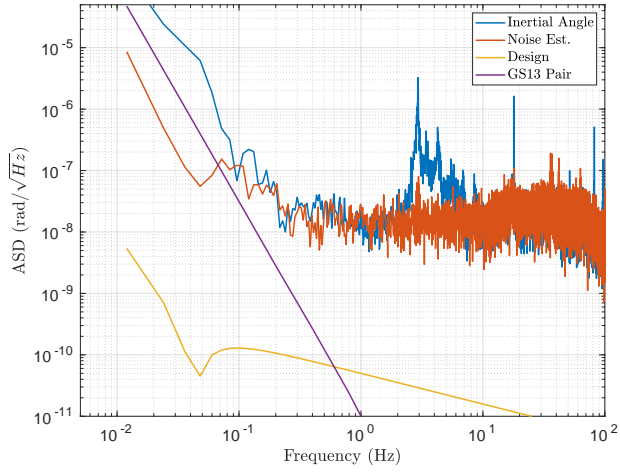


FIG. 2. REPLACE WITH TABLE CONTROLLED NOISE

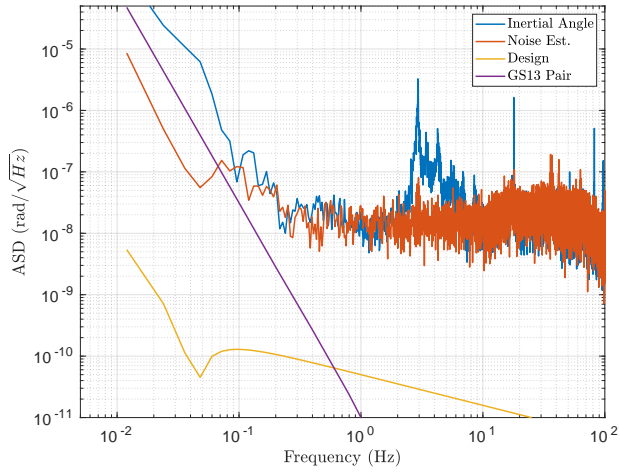


FIG. 3. REPLACE WITH IN LOOP PERFORMANCE.
Compare to previous configuration