

Accelerometers form a key part of the seismic isolation systems used in gravitational wave detectors. Traditional seismometers use large test masses to achieve excellent noise performance across a broad range of frequencies, but their large size and control systems don't make them ideal for every scenario. Our research focuses on the design of a lightweight, compact opto-mechanical accelerometer with comparable noise performance to that of larger devices as potential alternative in certain parts of test mass isolation systems. We do this by laser etching our oscillating parts out one piece of fused silica glass. This monolithic design maintains exceptionally high mechanical quality factor oscillators, lowering the thermal noise of the device. This is combined with an interferometric readout system using a high finesse cavity that can be directly incorporated into a quasi-monolithic assembly. So far research has focused on design and modeling of the oscillators noise performance, and measurements of mechanical losses sustained across bonding regions in the design. Ultimately, we are aiming to understand the actual noise limitations of such devices to judge whether they are able to match, or even surpass, the noise performance of the currently installed accelerometers in gravitational wave detectors.