



## **Optomechanical gravimeters and gravity gradiometers**

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We will introduce novel optomechanical sensors for gravimetry and gradiometry, which outline a path for highly compact systems consisting of stable mechanical oscillators and micro-optical cavities of exquisite sensitivity.

Progress in our research toward the realization of a first quasi-monolithic gravity gradiometer prototype show possible sensitivities around  $1 \text{ E}/\sqrt{\text{Hz}}$  with a baseline separation of 10-15 cm, between compact and light-weight optomechanical accelerometers performing at levels of  $0.1 \text{ nm}/\text{s}^2$ .

The accelerometer incorporates Fabry-Pérot fiber-optic micro-cavities onto a low-loss monolithic fused-silica mechanical oscillators that can measure the test mass displacement with resolutions near  $10 \text{ fm}/\sqrt{\text{Hz}}$ .

Current sensor concepts and results will be presented.