

Publication

A tunable fiber Fabry-Perot cavity for hybrid optomechanics stabilized at 4 K

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4657291**Author(s)** Ruelle, Thibaud; Jaeger, David; Fogliano, Francesco; Braakman, Floris; Poggio, Martino**Author(s) at UniBasel** [Braakman, Floris](#) ; [Fogliano, Francesco](#) ; [Jaeger, David](#) ; [Ruelle, Thibaud](#) ; [Poggio, Martino](#) ;**Year** 2022**Title** A tunable fiber Fabry-Perot cavity for hybrid optomechanics stabilized at 4 K**Journal** Review of Scientific Instruments**Volume** 93**Number** 9**Pages / Article-Number** 095003

We describe an apparatus for the implementation of hybrid optomechanical systems at 4 K. The platform is based on a high-finesse, micrometer-scale fiber Fabry–Perot cavity, which can be widely tuned using piezoelectric positioners. A mechanical resonator can be positioned within the cavity in the object-in-the-middle configuration by a second set of positioners. A high level of stability is achieved without sacrificing either performance or tunability, through the combination of a stiff mechanical design, passive vibration isolation, and an active Pound–Drever–Hall feedback lock incorporating a reconfigurable digital filter. The stability of the cavity length is demonstrated to be better than a few picometers over many hours both at room temperature and at 4 K.

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