

Quantum technology: Optomechanical gas pressure sensor, read out with squeezed light

Field: Experiment in a He3 demixing cryostat, optomechanical membrane light fibre interferometer

Motivation: Together with DESY, the University of Hamburg has applied for a patent for an optomechanical pressure sensor that covers 10 orders of magnitude in gas pressure measurement. It is limited at cryogenic temperatures by the heating of the membrane by the laser light used for readout. However, lowering the light output would reduce the signal so that the dark noise of the photodiode becomes relevant.

Objective: To prove that the pressure sensor can be read out at cryogenic temperatures with squeezed light, with less light hitting the membrane, but the signal-to-noise ratio does not change.