GWADW2023 - Gravitational-Wave Advanced Detector Workshop



Contribution ID: 95

Type: Poster

Upgrades of the reference actuator for the calibration of Advanced Virgo+

Tuesday, 23 May 2023 18:37 (1 minute)

The gravitational waves detectors of the LIGO, Virgo and Kagra collaborations use a mirror actuator using the radiation pressure of a laser as a reference for the calibration. This actuator is called the photon calibrator (PCal). The displacement of the mirror induced by the PCal is estimated from a measurement of the power of the laser reflected by the mirror. Thus, the calibration of the power sensors of the PCal is needed. This calibration has to be absolute and common with the collaborations LIGO and Kagra.

In this presentation, the design of the PCal installed on the Virgo interferometer will be shown, as well as the method to absolutely calibrate its power sensors. A procedure including the three collaborations and two national institutes of metrology (NIST and PTB) has been established to to inter-calibrate the power measurement standards of the different collaboration. And a setup to inter-calibrate the spheres has been built at LAPP and improved. Thanks to these improvements, the uncertainty on the mirror displacement estimation is expected to be below the 1% level for the O4 run. The plans for the upgrades toward O5 will be also shown.

Primary author: LAGABBE, Paul (LAPP)Presenter: LAGABBE, Paul (LAPP)Session Classification: Tuesday Poster session

Track Classification: Current detectors and prototypes: O4 Commissioning