GWADW2023 - Gravitational-Wave Advanced Detector Workshop



Contribution ID: 100

Type: Poster

The statics of the maraging blades in SuperAttenuators: simulation and tests

Tuesday, 23 May 2023 18:28 (1 minute)

In 2027, the Advanced Virgo Plus (AdV+) gravitational-wave detector will enter Phase II, a thermal noise reduction upgrade involving the increase of the terminal mirror masses from 42 kg to 104 kg. Both the terminal SuperAttenuators will thus have their load increased and their parts upgraded in such a way to keep the natural oscillation frequencies unchanged.

This requires a revision of all the vertical oscillators in the terminal SuperAttenuators, based on thin elastic blades of maraging steel.

Triggered by the need for stiffer maraging blades, we present a study of the statics of these parts of the SuperAttenuator and of the ideal loads. Furthermore, a simulation code allowing accurate previsions for realistically shaped blades is presented in comparison with the experimental tests. We show that the code can be also used to characterize the material, by getting an experimental value of the elastic modulus.

Primary authors: Mr BASTI, Andrea (University of Pisa); CHESSA, Piero (Istituto Nazionale di Fisica Nucleare); Mr PEGNA, Raffaello (INFN)

Co-authors: Mr BOSCHI, Valerio (INFN); Mr CELLA, Giancarlo (INFN); Mr PASSAQUIETI, Roberto (European Gravitational Observatory)

Presenter: CHESSA, Piero (Istituto Nazionale di Fisica Nucleare)

Session Classification: Tuesday Poster session

Track Classification: Current detectors and prototypes: Prototypes for R&D