



Contribution ID: 273

Type: oral

A new concept for compact seismic attenuation systems to improve low-frequency sensitivity of gravitational wave detectors

Wednesday, 25 September 2024 16:16 (17 minutes)

Third generation gravitational wave detectors like the Einstein Telescope will broaden our view of the Universe, thanks to higher sensitivities and broader frequency ranges. Improving the sensitivity in the low-frequency regime will enable the detection of coalescences of higher mass black holes and boost early alert capabilities for binary neutron star mergers, thus increasing the number of expected multimessenger observations. To achieve this goal, designing new-generation seismic attenuation systems will be a crucial R&D activity. We will introduce the main science cases and challenges for low-frequency gravitational wave observations, and we will present a new concept for a compact seismic attenuation mechanical filter that has the potential to reduce the size of current super attenuator systems, a result that could bring a leap in the sensitivity at low frequencies of gravitational-wave detectors and significant reduction in the underground civil work for the future Einstein Telescope.

Primary authors: RAZZANO, Massimiliano (University of Pisa and INFN-Pisa); FIDECARO, Francesco (University of Pisa and INFN); BELLIZZI, Lorenzo (Istituto Nazionale di Fisica Nucleare); DE SANTI, Federico; FIORI, Alessio (Istituto Nazionale di Fisica Nucleare); MUCCILLO, Luca; PALAIA, Maria Antonietta (Università di Pisa and INFN-Pisa); PAPALINI, Lucia (Istituto Nazionale di Fisica Nucleare); VACATELLO, Michele (Istituto Nazionale di Fisica Nucleare)

Presenter: RAZZANO, Massimiliano (University of Pisa and INFN-Pisa)

Session Classification: Gravitational Waves detection