Contribution ID: **483** Type: **Poster**

Simulating seismic isolation systems for the third-generation Gravitational Wave interferometers

Thursday, 30 May 2024 08:38 (1 minute)

Third-generation ground-based gravitational wave interferometers will broaden our view of the Universe. The Einstein Telescope (ET), expected to be built in Europe in 2030's will be an order of magnitude more sensitive than current interferometers like Advanced Virgo, LIGO and KAGRA and will have a frequency range extending down to 3 Hz. This low-frequency sensitivity will allow the detection of binary compact coalescence up to high redshift, improve the capability to study intermediate-mass black holes and enhance early alerts of binary neutron star coalescence. Design new generation seismic attenuation system is crucial to achieve higher sensitivity at low frequencies with respect to current interferometers. We present new simulation studies aiming at the design and optimization of prototypes of passive seismic isolation for the Einstein Telescope. The aim is to decrease the size of seismic attenuators, which are 17-m high in the current design, and significantly reduce the amount of underground civil works needed. The simulations, that foresee the inclusion of feedback by traditional means or through machine learning, allows to explore different seismic attenuation configurations under development, . that are offering a new promising perspective for the seismic isolation of the Einstein Telescope.

Collaboration

Role of Submitter

I am the presenter

Primary authors: RAZZANO, Massimiliano (Università di Pisa / INFN); FIDECARO, Francesco (University of Pisa and INFN); BASTI, Andrea (PI); BELLIZZI, Lorenzo (Istituto Nazionale di Fisica Nucleare); DE SANTI, Federico; FIORI, Alessio (Istituto Nazionale di Fisica Nucleare); PALAIA, Maria Antonietta (Istituto Nazionale di Fisica Nucleare); PAPALINI, Lucia (Istituto Nazionale di Fisica Nucleare); VACATELLO, Michele (Istituto Nazionale di Fisica Nucleare); PROSPERI, Paolo (INFN - Pisa); ORSINI, Leonardo (Istituto Nazionale di Fisica Nucleare); FRASCONI, Franco (Istituto Nazionale di Fisica Nucleare (INFN)); SPADA, Francesca Romana (Istituto Nazionale di Fisica Nucleare); BALESTRI, Gabriele (INFN); PILO, Federico (Istituto Nazionale di Fisica Nucleare (INFN)); LUCCHESI, Leonardo (Istituto Nazionale di Fisica Nucleare); GENNAI, Alberto (Istituto Nazionale di Fisica Nucleare)

Presenter: RAZZANO, Massimiliano (Università di Pisa / INFN)

Session Classification: Detector Techniques for Cosmology and Astroparticle Physics - Poster session

Track Classification: T1 - Detector Techniques for Cosmology and Astroparticle Physics