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The AiLoV-ET project: advanced optics and materials for tackling optical aberrations and thermal noise in Einstein Telescope

Two of the main limitations for the sensitivity of the current and future gravitational wave ground-based interferometers come from the optical aberrations - which impact the possibility to operate the detector at high power, a required condition to improve the quantum noise –and from the high-reflectivity coatings of the optics - which define the level of thermal noise.
The AiLoV-ET (Advanced Optics Lab @ Tor Vergata for ET) project - part of the ETIC consortium - will develop cutting-edge technologies for sensing and controlling wavefront aberrations, along with the characterization of new materials to produce improved reflective coatings for the next generation of gravitational wave detectors. A complete renovation of the Virgo/ET laboratory at Tor Vergata - with three brand-new experimental areas currently under construction - is aimed at hosting and supporting the AiLoV-ET objectives.
The current status of the renovation of the new infrastructure, together with a description of the facilities and techniques that will be hosted, will be presented and discussed.

Primary authors: AIELLO, Lorenzo (University of Rome Tor Vergata, INFN Rome Tor Vergata); Dr CESARINI, Elisabetta (INFN Roma Tor Vergata); CIFALDI, Maria (Tor Vergata-INFN); FAFONE, Viviana (University of Rome Tor Vergata, INFN Rome Tor Vergata); IANNI, Matteo (INFN, Section of Rome Tor Vergata, Rome, Italy. University of Rome Tor Vergata, Department of Physics, Rome, Italy); LORENZINI, Matteo (Università di Roma Tor Vergata, Dipartimento di Fisica); LUMACA, Diana (INFN Sezione di Roma Tor Vergata); MINENKOV, Yury (INFN Roma Tor Vergata); NARDECCHIA, Ilaria (INFN Roma Tor Vergata); ROCCHI, Alessio (INFN Roma Tor Vergata); SCACCO, Valerio (Università degli Studi di Roma Tor Vergata; INFN sez. Roma Tor Vergata); TARANTO, Claudia (University of Rome Tor Vergata)

Presenter: AIELLO, Lorenzo (University of Rome Tor Vergata, INFN Rome Tor Vergata)

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