

New Generation Superattenuators (NGSA) for Einstein Telescope: status of the projet

The 3rd generation instrument era is approaching, and the Einstein Telescope giant interferometer is becoming a reality with the possibility to install the detector in an underground site where seismic noise is 100 times smaller than on surface. Moreover, new available technologies and the experience acquired in operating advanced detectors are the key points to further extend the detection bandwidth down to 2-3 Hz with the possibility to suspend a cryogenic payload. NGSA is an R&D project, involving the Napoli, Pisa and Sassari ET groups, based on the improvement of vibration isolation performance for 3rd generation detectors of Gravitational Waves ‘Einstein Telescope (ET)’. Starting from the present mechanical system of the Advanced VIRGO interferometer (2nd generation), considered compliant with 3rd generation detector, we studied the possibility of improving the attenuation performance. This has been done with a multistage pendulum chain equipped with new magnetic anti-springs that is hung to a double Inverted Pendulum in nested configuration (NIP). The main outcoming goal is the construction and test of a NIP prototype in the “PLANET” laboratory in Naples. In this talk, we present the status of the NGSA project pointing out the impact of two seismic isolation system solutions, with different heights, on the sensitivity of ET-LF interferometer. In addition, the status of the NIP prototype construction will be reported.

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