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High-frequency gravitational waves in the geometrical optics approximation

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With the first detection of gravitational waves in 2016 a new window on the observation of the Universe has been opened. This has made possible several new tests of general relativity, discoveries on the physics of black holes, and opened a new way of studying physics beyond the Standard Model. There is evidence that the Standard Model (SM) of particle physics is not the ultimate description of nature as it cannot explain neutrino masses, dark matter, and the baryon asymmetry of the Universe, gravitational waves could be one of the main tools to answer to this question.
So far, gravitational waves have been detected only at low frequencies: at nHz for the recent stochastic background, and 10-100 Hz from the observations of LIGO-VIRGO and KAGRA. Several works showed how it would be possible to get important new information relevant to theoretical particle physics and cosmology at higher frequencies, from MHz to GHz.

In this project we revisit the work "2000 Class. Quantum Grav. 17 2525"by A. M. Cruise, and discuss the validity of the geometrical optics approximation in electromagnetic detectors for very high-frequency gravitational waves

Title of the Poster/Talk

Related Papers/Preprints

Primary author: MARSILI, Luca (IFIC)

Presenter: MARSILI, Luca (IFIC)

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