

Detection of tensor and scalar gravitational waves by means of interferometric antennas

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There is presented a new method for the determination of a polarization state of an incoming gravitational wave (GW) by means of interferometric antennas when the source localisation is known. Modern gravitational theories predict the existence of several polarization states of gravitational waves including scalar and tensor modes. The method is based on the analysis of antennas beam patterns different for different polarization states as well as a comparison between GW strains at each couple of detectors. A network of three and more working interferometric antennas localises a position of the GW source in a point on the sky, therefore providing the possibility to recognise a polarization mode of an incoming GW.

The recent announcement on 1st August 2017 about the start of the new observation run with three interferometric antennas of LIGO-Virgo Collaboration opens a new possibility to test a theory of gravitation.using the proposed method.

Primary author(s) : Ms. FESIK, Liudmila (Saint Petersburg State University)

Presenter(s) : Ms. FESIK, Liudmila (Saint Petersburg State University)

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