

Abstract

Gravitational Wave data Analysis in the Low-Frequency Band

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The Laser Interferometer Space Antenna (LISA) is a space mission aimed to detect and study gravitational radiation in the millihertz frequency band. In the low-part of the LISA accessible band (10^{-4} - 10^{-3}) its sensitivity will be limited by the stochastic background originated by the superposition of hundreds of millions of signals from white-dwarf binaries present in our own galaxy.

In this talk an estimate is presented of the upper frequency cutoff of this stochastic background, obtained by including the modulations of the gravitational wave signal due the motion of the detector around the Sun. Our calculations show it to be smaller than the value previously estimated, implying a total number of resolvable signals several times larger than the number derived by earlier calculations.

Our theoretical derivation is complemented by a numerical simulation, which demonstrates that by using the maximum likelihood method it is possible to accurately estimate the parameters of the resolvable signals and then remove them from the LISA data.