

Gravitational Wave Frequency Range for the LISA Mission

W.M. Folkner
Jet Propulsion Laboratory, California Institute of Technology

P.L. Bender, R. T. Stebbins
JILA, University of Colorado

Studies of the Laser Interferometer Space Antenna mission are being pursued actively both in Europe and in the US. The present mission design calls for three spacecraft to be launched on a single Delta II launch vehicle and placed in an equilateral triangle configuration about 20 degrees behind the Earth in orbit around the Sun. Laser heterodyne measurements made over the 5 million km sides of the triangle permit the detection and detailed study of gravitational wave signals.

The frequency range discussed for LISA usually has been limited to 0.0001 to 1 Hz because of reliance on passive thermal isolation to keep noise due to temperature fluctuations in the most sensitive part of the payload small. However, the possibility of actively controlling the temperature of the thermal shield around the payload is now being investigated. The expected improvement in the LISA sensitivity below 0.0001 Hz will be discussed. This would extend the useful sensitivity to include possible sources with larger masses, such as the coalescence of massive black holes after galaxy mergers.