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## Preliminary Optimal Orbit Design for the Laser Interferometer Space Antenna

By Steven P. Hughes

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 22 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. In this paper we present a preliminary optimal orbit analysis for the Laser Interferometer Space Antenna (LISA). LISA is a NASAESA mission to study gravitational waves and test predictions of general relativity. The nominal formation consists of three spacecraft in heliocentric orbits at 1 AU and trailing the Earth by twenty degrees. This configuration was chosen as a trade off to reduce the noise sources that will affect the instrument and to reduce the fuel to achieve the final orbit. We present equations for the nominal orbit design and discuss several different measures of performance for the LISA formation. All of the measures directly relate the formation dynamics to science performance. Also, constraints on the formation dynamics due to spacecraft and instrument limitations are discussed. Using the nominal solution as an initial guess, the formation is optimized using Sequential Quadratic Programming to maximize the performance while satisfying a set of nonlinear constraints. Results are presented for each of the performance measures. This item ships from La Vergne, TN. Paperback.


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