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Title:

Metrology System Design for SIM System Testbed 3

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Abstract:

The SIM System Testbed 3 (STB-3) is a 3-baseline interferometer mounted on a full scale SIM-like flexible structure, developed at JPL under the Interferometry Technology Program. The goal of the testbed is to demonstrate angle and pathlength tracking of a dim science star by feeding forward information from the two interferometers looking at bright guide stars to the science interferometer. This paper presents the optical architecture of the STB-3 metrology systems and the results of some initial tests.

The instrument is a triple Michelson interferometer on a structure. One interferometer is defined as a "science" baseline whereas the other two are called "guide" baselines. Each interferometer has its own internal metrology system, based on heterodyne laser, monitoring the instrument optical path and controls the position of the delay line. Positions of each delay line in the "guide" interferometers then are feedforwarded to the "science" interferometer for tracking the dim star. An external metrology system monitors changes in the size of common baseline.

Key Words:

Interferometry, metrology, optics

Biography:

Alireza Azizi has a Ph.D. in Physics from UCLA. He has been working on the Interferometry Technology Program at JPL since 1998.