External Calibration for the Space Interferometry Mission

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Abstract

The Space Interferometry Mission (SIM) will launch a space-borne optical interferometer with 10 meter baseline in 2009. It will have the capability to measure absolute angular positions of stars to accuracy of 4 microarcseconds; relative positions of stars within a 1-degree narrow-angle field will be measured to an accuracy of 1 microarcsecond.

The basic measurements of SIM's interferometer are delays:
d = B*S + C, where d = delay, B = baseline vector,
S = unit vector to the star being measured,
C is a scalar field-dependent correction that needs to be periodically updated.
The basic calibration problem is to correct the delay for the field-dependent term.

Our approach to this problem is 'external' -- we determine C from measurements on a specially chosen field of calibration stars.

This external calibration method will be presented, along with results of astrometric simulations demonstrating its feasibility.

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