

SIM Science Operations

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This paper describes the science scheduling and operation of the Space Interferometry Mission (SIM) as a science instrument. A brief overview of the approved science programs of the SIM Science Team, and future guest observer opportunities will be presented. The scheduling and operation of SIM differs significantly from other astrometric or imaging space-based telescopes. A timeline of observations is developed using a scheduling unit called a 'tile' - a set of related science and reference star observations made while the instrument is inertially pointed. Global astrometry, for measuring stellar distances and velocities, is performed by observing multiple overlapping tiles covering the whole sky. Most observing programs require many short observations over the life of the mission, which poses interesting challenges for scheduling tools in developing the science timeline. Development of these tools will be done by the Interferometry Science Center at Caltech. Planning tools will allow users to perform trades of the expected science performance, for instance by varying the number of observations of a target against the time spent on an individual observation. The search for planets will require careful optimization of the selection of target and reference stars in a tile, and their observing sequence, to minimize instrumental systematic errors which may be a function of direction on the sky or due to thermally-induced drifts in the instrument.