Effectiveness of Screening Space Interferometry Mission Grid Star Candidates Via Radial Velocity Observations -- A Monte Carlo Approach

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The Space Interferometry Mission requires an astrometric grid of over a thousand bright (V~12) stars distributed quasi-uniformly on the celestial sphere. Grid star candidates currently consist of several thousand K giants at a distance of 1 or 2 kiloparsecs. SIM grid stars must be astrometrically stable to better than 4 microarcseconds over the nominal five-year mission in order to provide a reference frame for SIM's high-precision astrometric measurements.

The presence of stellar or planetary companions could render a grid star candidate astrometrically unstable and therefore unfit for the grid. Using Monte Carlo simulations, and a priori information about binarity of solar-type stars, we investigate the effectiveness of screening SIM grid star candidates via three or four radial velocity measurements over four years. We determine the required radial velocity measurement precision for this filtering scheme.

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