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Disentangling Confused Stars at the Galactic Center with Long Baseline Infrared Interferometry JORDAN STONE, JOSH EISNER, University of Arizona, JOHN MONNIER, University of Michigan, JULIEN WOILLEZ, PETER WIZINOWICH, W. M. Keck Observatory, JORG-UWE POTT, Max-planck-Institut für Astronomie, ANDREA GHEZ, UCLA — We present simulations of Keck Interferometer ASTRA and VLTI GRAVITY observations of mock star fields in orbit within $\sim$ 50 milliarcseconds of Sgr A*. Our results show an improvement in the confusion noise limit over current astrometric surveys, opening a window to study stellar sources in the region. For the Keck Interferometer, the improvement in the confusion limit depends on source position angles. The GRAVITY instrument will yield a more compact and symmetric PSF, providing an improvement in confusion noise which will not depend as strongly on position angle. Our Keck results show, we are able to detect and track a source down to $m_K \sim 18$ through the least confused regions of our field of view at a precision of $\sim$ 200 μas along the baseline direction. Our GRAVITY results show the potential to detect and track multiple sources in the field. GRAVITY will perform $\sim$ 10 μas astrometry on a $m_K = 16.3$ source and $\sim$ 200 μas astrometry on a $m_K = 18.8$ source in six hours of monitoring a crowded field. Monitoring the orbits of several stars will provide the ability to distinguish between multiple post-Newtonian orbital effects, including those due to an extended mass distribution around Sgr A* and to low-order General Relativistic effects. (abridged)

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