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Title: Terrestrial Planet Finder Interferometer: Architecture Definition, Mission Design and Technology Development

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This overview paper presents the system design and technology development for two interferometer concepts being developed for the Terrestrial Planet Finder (TPF) project to support a 2006 downselect between these concepts and a visible coronagraph. The two interferometer concepts are the structurally-connected (SCI) and the formation-flying interferometer (FFI), intended to fulfill the minimum and full TPF science goals respectively. Trade results, based on signal-to-noise and star-selector analysis, are that the best SCI strawman architecture is a dual-chopped Bracewell 36-m linear array of four 3.2-m diameter apertures, and that the best FFI strawman concept is a similar array of 4.0m apertures on formation-flying array of variable dimension from 70m to 200m. For the FFI concept, a trade matrix compares the 1-dimensional and 2-dimensional nulling input apertures. Based on these architectures, science requirements are related by system error budgets to flight mission designs, which in turn motivates technology development in several key areas: broadband white-light nulling, stability of cryogenic structures, and precision formation flying. A technology program that is responsive to key technical goals is described, and highlights of recent technical milestones from that program are described. The paper concludes by identifying the most important next steps in the science capability assessment, system design, and technology development.