

Abstract

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Title: Terrestrial Planet Finder Interferometer System Design

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This paper and oral presentation will describe the technical system design of the mid-infrared nulling interferometer architectures of the Terrestrial Planet Finder. Two architectures – structurally connected and formation-flying – are being studied as mission concepts to detect Earth-like planets around nearby stars and look for life. The structurally connected concept requires four 3.2-meter apertures on a 36-m cryogenic boom at L2. The formation-flying concept requires the same number of apertures on separate spacecraft, along with a fifth combining spacecraft. The paper describes how mission science objectives and interferometer nulling architectures drive the flight system design, and how flight-system constraints of mass and volume influence the fundamental instrument architectures and science throughput. The interferometer instrument design will be described, as will the structurally-connected and formation-flying flight systems.

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