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Abstract:The ALMA Band 10 (787-950 GHz) receiver is a dual-polarization heterodyne system based on NbTiN superconducting technology. The coupling of energy from the secondary mirror of the ALMA Cassegrain antenna to the Superconductor- Insulator-Superconductor (SIS) mixers used for down-conversion is achieved by a frequency-independent optical system composed of two elliptical mirrors to focus and redirect the incoming radiation, a wire-grid to separate orthogonal linear polarizations and two corrugated horns, one for each polarization and SIS mixer. In this paper, we present the ALMA Band 10 tertiary optics design and evaluate its performance by quasi-optical techniques, Physical Optics simulations and measurements. Detailed results of secondary aperture efficiency and beam-squint are provided. The characterization procedure described in this paper can be used for any optical system at around 1 THz.
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