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Far-sidelobe and Polarization Angle Measurement of LiteBIRD Low Frequency Telescope using a 1/4-scaled Model

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The LiteBIRD Low Frequency Telescope (LFT) is a crossed-Dragone telescope that observes 34-161 GHz with a field of view of 18 x 9 degrees. We developed a 1/4-scaled model of the LFT and measured its far-sidelobes and polarization angles at multiple positions on the focal plane at accordingly scaled wavelength. The near-field measurements were consistent with physical optics simulation down to -50 dB level, and showed that the far-sidelobes for two orthogonal polarization directions are consistent with each other down to -40 dB level. The compact antenna test range measurements determined the polarization position angle of the LFT with a resolution of less than 0.1 arcminutes, and showed that the angle varies by up to 1 degree at the edges of the focal plane.

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