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APPLICATION ANALYSIS AND DESIGN OF MOON-EARTH COMMUNICATION ANTENNAS OF
CHANG'E-3 LUNAR ROVER

Abstract

To meet need for the lunar rover's moon-earth communication, a combination approach of low gain wide beam-width antenna and high gain directional antenna are presented. The low gain antenna is an open-ended circular waveguide with parasitic elements, which features omnidirectional pattern and low back-lobe. Its pattern with multi-attitude of the rover is carefully simulated and measured, and the result provides important reference for rover's path planning on the rover. To meet the need for high gain antenna under limited space on the rover, a transformed ring-focus paraboloid antenna is specifically invented. It features high radiation efficiency and high gain under limited dimension. Besides, it also works as additional supporting part of mast on the rover. The antennas above are successfully applied in Chang'e-3 lunar rover.