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J Aeronaut Aerospace Eng 2018, Volume 7
DOI: 10.4172/2168-9792-C1-023

4th International Conference and Exhibition on

Satellite & Space Missions

June 18-20, 2018 | Rome, Italy

Design and analyzing offset parabolic antenna in C band for communication satellite

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This paper presents a C band parabolic antenna sizing mythology used on a satellite telecommunication and the relevant results, we focus on the single reflector with national coverage beam of Algeria reflector antennas are widely used in space applications for communication satellites. The main reasons for the use of reflector antennas as opposed to other types, such as array antennas and lens antennas, are mature technology, high performance, low losses, low cross-polar levels, thermal stability, simpler feeds, and wide bandwidths Communication satellites have multiple reflector antennas on each spacecraft that provide various services. Typical satellite services that employ reflector antennas include the following: 1. fixed satellite services (FSS) that provide shaped or contoured beams for domestic or regional satellite services. These antennas operate in the C-band. Our study was conducted for the Algerian future communication satellite (33.5° W) in the case of FSS service, national beam in C band. Considering a global pointing error (Beam pointing error) BPE = 0.12°, a circular beam of (3.28 + 2 x 0.12)° = 3.52°. The directivity Emergency Operations Center increase with antenna diameter until reach a maximum (the optimal configuration) and then start to decrease. The key parameter for the design of optimal offset antenna is DEOC.

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