

论文

卫星阵馈反射面多波束天线赋形波束的性能分析

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摘要

该文主要对赋形波束的性能与波束宽度和波束间隔间的关系进行了一般性的研究。首先提出4个能够描述赋形波束性能好坏的性能指标。然后给出波束赋形问题的数学模型, 这个模型建立了赋形波束的性能指标与波束宽度和波束间隔间的关系。接着应用泛函分析理论推导了波束赋形问题的一般解, 同时通过对这个一般解的讨论, 从信号与系统的角度阐明了波束赋形的机理。最后通过一个实际的例子分析了波束赋形的两个参数波束宽度和波束间隔与性能指标之间的变化关系, 并提出了选择最佳波束宽度和波束间隔的简易方法。

关键词 [卫星通信](#) [多波束天线](#) [波束赋形](#)

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Performance analysis of shaped beam for multiple-beam antennas with array-fed reflectors

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Abstract

In this paper a general study of the relation between the performance of shaped beams and beam width and spacing has been done for multiple-beam antennas with array-fed reflectors. Four parameters indicating the performance of shaped beams are first denned. On the basis of these parameters, a mathematical model of beam-shaping is presented which determines the relation between the performance of shaped beams and beam width and spacing and then this model is resolved by using functional analysis theory. Through the discussion of the solution, the mechanism of beam shaping is shown in signal and system way. Then this mechanism and the relation are illustrated by the explanation of the simulation results of a practical example. According to the relation proved above, with given performance parameters, optimum beam width and spacing can be chosen, which correspondingly determine the optimum configuration of the antenna. A very simple formulation for choosing the optimum beam width and spacing is finally obtained, as a result of the discussion in this paper.

Key words [Satellite communication](#) [Multiple-beam antenna](#) [Beam shaping](#)

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