论文

互阻抗精度对实现天线极低副瓣的限制

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摘要
实现极低副瓣阵列天线需要作精确的互耦补偿. 如果阵列的互阻抗(或互耦系数)矩阵确知, 理论上可以精确补偿互耦的影响, 从而实现极低副瓣接收。但无论是计算还是测量得到的互阻抗矩阵都只有一定的精度, 这个精度最终决定了补偿效果。本文研究了极低副瓣阵列天线中互耦补偿对互阻抗精度的要求; 推导出了互阻抗误差与通道幅相误差的关系; 进而得到了互阻抗误差与副瓣电平的关系。

关键词　　阵列天线　 互耦 　低副瓣 　容差 　数字波束形成

分类号

扩展功能

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THE LIMITATION OF MUTUAL IMPEDANCE PRECISION TO THE SIDELOBE LEVEL OF ARRAY ANTENNA

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Abstract
Generally speaking, an accurate mutual coupling correlation is necessaryfor an array antenna to reach ultra-low sidelobe level. If the mutual impedance or mutual coefficient matrix of an array is perfectly known, one can completely compensate the effect of mutual coupling and realize the desired low sidelobe level in theory. However, the mutual impedance matrix obtained whether by calculation 01 by measurement has a limited precision, which limits the availability of the compensation. This paper deals with the requirements on
the precision of mutual impedance for compensation. in ultra-low sidelobe array antenna. The relationship between mutual impedance errors and the amplitude and phase errors of channels is derived, by which the relationship between mutual impedance error and the sidelabe level is given.

Key words　 Antenna arrays 　Mutual coupling 　Low sidelobe 　Tolerance 　Digital beam forming

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