

传感器与信号处理

基于谐振区频域数据的雷达目标极点提取方法

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摘要:

提出了一种基于谐振区频域数据的雷达目标极点提取方法。对目标在谐振区频段内的频域散射数据作逆傅里叶变换,得到目标时域散射数据;重点研究了早晚期瞬态响应区分以及极点数目模糊对极点提取的影响,提出了一种改进的整体最小二乘矩阵束方法,用于对导体目标极点进行提取。通过对细杆目标和飞机目标的不同方位的极点提取验证了方法的准确性。

关键词: 极点 频域数据 晚期响应 改进的整体最小二乘矩阵束

Radar target poles extraction by exploiting frequency response of resonance region

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Abstract:

A new method is proposed to estimate the parameters of damped sinusoids (poles) utilizing scattering responses data in frequency domain. Scattering responses of the frequency band in resonance region are calculated by the method of moments (MoM), and transient scattering responses are obtained using a fast inverse Fourier transform. The influence of poles number unknown and distinguishing early time and late time transient responses on poles extraction is investigated. Then a modified total least square matrix pencil method (MTLS MPM) is presented and verified by two simulation examples of thin wire and aircraft. Poles results of them extracted for frequency domain data in different azimuth show that the new method is more convenient and precise in practice.

Keywords: pole frequency data late time transient response modified total least square matrix pencil method (MTLS MPM)

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