Abstracts

Back-Scattering Measurements of a Slowly Moving Target

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A basic problem in the measurement of back-scattering cross sections is the separation of the desired target-scattered signal from the undesired background reflections. An additional problem may be the separation from the target-scattered signal of signals directly coupled from the transmitter to the receiver. Historically, these have been overcome in several ways: 1) a reference signal has been used to cancel the undesired signals when measuring a fixed target, 2) a reference signal has been used to override the undesired signals when measuring a rapidly moving target, and 3) an average curve has been fitted to data taken with a target at several positions. Two useful alternative techniques are described herein. A cancellation procedure performed while the target is slowly moving is shown to be effective in a much poorer environment than the static nulling procedure. The use of a reference signal to override the undesired signals is shown to be directly applicable to a slowly moving target procedure, thus simplifying the mechanical problems in measuring bulky targets. With a simple experimental setup, back-scattering cross sections 33 db below a square wavelength at 11 Gc can be measured at a range of 150 cm when transmitting 400 mw. These readings can be taken in an environment 20 to 30 db worse than that usually considered necessary for scattering measurements by the static null procedure.

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