Abstracts

Dispersion of Pulsed Electromagnetic Waves in Plasma (Correspondence)

H.J. Schmitt. "Dispersion of Pulsed Electromagnetic Waves in Plasma (Correspondence)." 1965 Transactions on Microwave Theory and Techniques 13.4 (Jul. 1965 [T-MTT]): 472-473.

Observations of the dispersion of electromagnetic pulses in isotropic plasmas and gyrotropic plasmas show that the response is distorted due to the excitation of weakly damped oscillations characteristic of the natural frequencies of the plasma. For diagnostic application, signals with a smooth frequency spectrum, such as steps or short unidirectional pulses, allow a simple correlation between the observed response and the relevant plasma parameters. In radar or communications systems, however, the dispersion of sinusoidal pulses carrying information in the pulse amplitude or in the pulse duration is important. Due to the relatively high spectral intensity near the carrier frequency, a pronounced signal distortion arises if the carrier frequency is comparable to a natural oscillation frequency of the plasma.

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