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Transient Radiation Fields in Antennas

Shinobu TOKUMARU*

The transient responses of the radiation fields of a cylindrical transmitting antenna and a Yagi antenna with two elements are investigated for the cases of step function- and sinusoidal step function-excitations. The theoretical analysis makes use of Fourier's theorem to express the response as an integral over the response to all individual frequency components. The responses as functions of time show forced oscillations with the driven frequency, whose field patterns show gradual rises with the time constants determined by the input impedance of the antenna. The relations between the transient time and the geometrical configuration of the antenna are also discussed.

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