Abstract:
Measurements in the antenna near field allow to compute the far-field radiation pattern by a postprocessing near-field far-field transformation. These algorithms use equivalent sources to model the radiation behavior of the antenna and have to consider the field probe influence present in near-field antenna measurements when relating the measured probe signals to the equivalent sources. In order to test and validate near-field transformation algorithms without errors introduced by the measurement setup and environment, synthetic data is often used. However, in order to generate realistic near-field data the probe effects on the measurement have to be considered. In this paper a synthetic data generation technique is shown which models the antenna as well as the probe by distributions of electric dipoles. The probe signals are obtained by evaluating the dyadic Green's function of free space for all antenna-probe-dipole combinations and finally superimposing them. This allows to synthesize near-field measurement scenarios with manifold antennas and probes very flexibly. The technique is applied to validate the plane wave based near-field far-field transformation algorithm.

Stichworte:
Antenna measurements, antenna radiation patterns, dipole antenna-probe, dipole antennas, dyadic Green's function, electric dipole based synthetic data generation, electric variables measurement, far-field radiation pattern, Green's function
methods, Horn antennas, postprocessing near-field far-field transformation algorithm, probe signals,
probe-corrected near-field antenna measurements, probes, synthetic data generation technique

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