

## **Weights Estimation of Phased Arrays moving in a Test Field**

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Due to the high performance and degree of flexibility of microwave instruments using phased array antennas, a comprehensive characterization of the antenna is essential and a major challenge. New concepts are needed to keep the costs and effort acceptable. A new characterization technique is proposed, the so-called Weight-Estimation Method (WEM), which permits the excitation coefficients, or weights of the array elements to be estimated from a limited number of far-field measurements. With these weights, i.e. the gains and phase settings applied to the elements of the phased array, the complete antenna pattern in the range of +/- 90 degree about the boresight can be derived. The concept is applicable for any phased array system sensing electromagnetic signals. The paper describes the measurement concept, the estimation method and presents simulated results for measurements in a compact range and with the antenna in motion. The method was developed to characterize phased array antennas of synthetic aperture radars (SAR) and promises to simplify the on-board calibration circuitry of future instruments.