

# Compensation of Mutual Coupling in an Antenna Array for Direction of Arrival Estimation

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**Abstract**— In this paper, we propose a stable estimation method of direction of arrival (DOA) using an antenna array with mutual coupling. In a real antenna array, the mutual coupling between elements distorts the array output signal and degrades the performance of DOA estimation. Because the coupling effect is symmetric about each element, the mid-array of which the elements are affected equally is insensitive to the mutual coupling. We estimate the coupling coefficients by using this property, compensated the array output using them, and estimate the DOA using the compensated signal. The mutual coupling coefficients are gradually updated in an adaptive manner to guarantee convergence. As a result, we can get more stable or more accurate DOA estimate.

**Keywords**— Antenna array, ESPRIT, mutual coupling, direction of arrival



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