

### 一种矢量传感器耦合误差的校正方法

王桂宝\*<sup>①</sup> 陶海红<sup>①</sup> 王兰美<sup>②\*</sup>

<sup>①</sup>(西安电子科技大学雷达信号处理国家重点实验室 西安 710071)

<sup>②</sup>(西安电子科技大学理学院 西安 710071)

## A Calibration Method for Mutual Coupling Across a Vector Sensor

Wang Gui-bao<sup>①</sup> Tao Hai-hong<sup>①</sup> Wang Lan-mei<sup>②\*</sup>

<sup>①</sup>(Key Lab for Radar Signal Processing, Xidian University, Xi'an 710071, China)

<sup>②</sup>(School of Science, Xidian University, Xi'an 710071, China)

摘要

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**摘要** 该文根据电磁学理论给出了电磁矢量传感器的耦合误差矩阵数学模型。利用一个辅助校正源,根据子空间理论得到存在耦合误差的导向矢量。利用理想的和存在耦合误差的导向矢量之间的关系,通过矩阵运算得到归一化误差的最小二乘解,并对各个阵元逐一校正,从而实现整个阵列耦合误差的校正;最后的数值仿真结果表明了该方法的有效性。

**关键词:** 电磁矢量传感器 误差校正 耦合误差

**Abstract:** Based on the theory of electromagnetics, the mutual coupling matrix model between the elements of an electromagnetic vector sensor is put forward in this paper. Using one reference signal source and according the subspace theory, the coupled array manifold is obtained. According the relation between the coupled and the uncoupled array manifolds and by matrix operations, the least squares solution of normalized coupling matrix is obtained. The whole array is calibrated by array elements being calibrated one by one. Finally, the simulation results demonstrate that this approach is correct and effective.

**Keywords:** Electromagnetic vector sensor Error calibration Mutual coupling errors

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通讯作者: 王桂宝 Email: gbwang@stu.xidian.edu.cn

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