

## 频带合成机载SAR的运动补偿

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## Motion Compensation for Airborne SAR with Synthetic Bandwidth

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摘要

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**摘要** 频带合成技术能够有效改善SAR距离向分辨率,在条带模式下,为了获得与距离向相比拟的方位向分辨率,高精度的运动补偿必不可少,该文研究了频带合成系统两步补偿方案中的关键问题。首先,在利用IMU/GPS组合导航数据进行运动补偿时,目标的作用距离以及载机的理想航线往往是未知的,该文结合地面角反射器的导航信息,计算出目标的实际作用距离,并且给出一种确定载机理想航线的新方法,提高了运动补偿的精度。然后,利用一种改进的相位梯度自聚焦(PGA)算法补偿剩余的时变相位误差。实际数据证明,经过上述补偿后获得了优于0.25 m的方位向分辨率。

**关键词:** 合成孔径雷达 频带合成 运动补偿

**Abstract:** Bandwidth synthetic technique provides a fine range resolution for the advanced airborne SAR system. In strip-map mode, in order to get an as good azimuth resolution as the range, the precise motion compensation is important. This paper studies several key issues of the “two-step” motion compensation method in the bandwidth synthetic system. In the first compensation step the precise Inertial Measurement Unit (IMU)/GPS data is used, the real target distance and the ideal airborne line are always unknown. In this paper, the corner reflectors are used to estimate these values. And in the second step, an improved Phase Gradient Autofocus (PGA) algorithm is used to compensate the residual time-mutative phase error. Real data testifies that after the “two-step” compensation the azimuth resolution better than 0.25 m is obtained finally.

**Keywords:** Synthetic Aperture Radar (SAR) Synthetic bandwidth Motion compensation

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