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一种新的弹载SAR高分辨成像方法

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A Novel High Resolution Imaging Method for the Missile-borne SAR

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摘要 导弹在俯冲下降运动中飞行姿态变化较大、造成目标斜距表达式较为复杂，给弹载合成孔径雷达(SAR)成像算法提出了新的要求。针对这个问题，该文提出了一种新的弹载SAR成像方法，首先将目标斜距方程近似为慢时间的4阶近似式，再利用卡尔丹方程解得驻相点的精确解，进而得到信号的2维频谱表达式，然后以此为基础推导了相应的成像算法。最后，点目标仿真结果说明，与传统方法相比该文所提方法具有良好的成像效果，能够在导弹俯冲下降运动中实现全孔径高分辨成像。

关键词： 弹载SAR   卡尔丹方程   2维频谱

Abstract： Due to the variational flight path during the diving maneuver, the range function of the point target for the missile-borne SAR becomes complicated. Thus, a new imaging method is proposed in this paper. Firstly, the target range function is expanded to a quartic polynomial. Secondly, the stationary point is solved via the Cardano's formula, and then the tow-dimensional spectrum is obtained, based on which a new imaging algorithm is derived. Finally, the simulation result of the point targets shows that the algorithm proposed is effective to give a high resolution imagery with the entire aperture of the missile-borne SAR than the traditional method.

Keywords： Missile-borne SAR   Cardano's formula   Tow-dimensional spectrum

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引用本文：

周鹏, 熊涛, 周松, 李亚超, 邢孟道.一种新的弹载SAR高分辨成像方法[J] 电子与信息学报, 2011,V33(3): 622-627

Zhou Peng, Xiong Tao, Zhou Song, Li Ya-Chao, Xing Meng-Dao.A Novel High Resolution Imaging Method for the Missile-borne SAR[J] , 2011,V33(3): 622-627

链接本文：

http://jeit.ie.ac.cn/CN/10.3724/SP.J.1146.2010.00904   或   http://jeit.ie.ac.cn/CN/Y2011/V33/I3/622