



航空学报 » 2006, Vol. 27 » Issue (5) :816-822 DOI:

论文

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### 直升机旋翼桨叶动态RCS特性研究

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### Dynamic RCS Behavior of Helicopter Rotating Blades

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摘要

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**摘要** 从时域和频域两方面,对直升机动态旋翼的RCS特征进行了较全面研究,即不仅考虑旋翼的旋转运动,而且还考虑桨叶的变距、挥舞和桨盘倾斜等引起RCS的动态效应。以NACA0012为翼型的直平翼作为直升机旋翼桨叶,建立旋翼桨叶的几何模型,采用物理光学和等效电磁流法,计算各种运动情况下旋翼RCS的时域曲线,然后用准静态法计算一个周期内的平均多普勒频谱,最后,对连续的瞬时频谱进行时间-频谱分析,得到一些重要研究成果。

**关键词:** 旋翼 雷达散射截面 物理光学法 等效电磁流法 准静态法

**Abstract:** This paper seeks to explore the influence of the rotary motion, variable-pitch, flapping and sloping of helicopter rotating blades on the dynamic RCS behavior in the aspects of time and frequency domains respectively. Based on the NACA0012 aerofoil, a geometric model of helicopter rotating blades is established for the dynamic RCS computation. By means of the physical optic (PO) and the equivalent currents methods (ECM), the RCS time domain curves of helicopter rotating blades are calculated in the cases of various motions. And then, the mean Doppler spectrum in a cycle is computed using the quasi-static method. A continuous instantaneous time spectrum is analyzed to conclude some valuable results for the engineering design of helicopter rotating blades

**Keywords:** helicopter rotating blade radar cross section (RCS) physical optic (PO) equivalent currents methods (ECM) quasi-static method

Received 2005-04-14; published 2006-10-25

#### 引用本文:

叶少波;熊峻江. 直升机旋翼桨叶动态RCS特性研究[J]. 航空学报, 2006, 27(5): 816-822.

YE Shao-bo; XIONG Jun-jiang. Dynamic RCS Behavior of Helicopter Rotating Blades[J]. Acta Aeronautica et Astronautica Sinica, 2006, 27(5): 816-822.

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