



航空学报 » 1989, Vol. 10 » Issue (9) : 413-419 DOI:

论文

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贴地飞行时旋翼空气动力学实验研究

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AN EXPERIMENT STUDY OF ROTOR AERODYNAMIC IN GROUND EFFECT AT LOW SPEED

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摘要

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摘要 本文对贴地飞行时的旋翼进行了流场显示和桨盘处下洗速度测量的实验研究。揭示并研究了环流和地面涡现象及其对旋翼平面下洗速度分布的影响,指出了旋翼贴地飞行时拉力、力矩等剧烈变化的原因。

关键词:

Abstract: Results of an experimental study of the aerodynamics of a helicopter rotor in ground effect at low speeds are presented in this paper. Experiments of rotor wake flow visualization and induced velocity measurement near the rotor disc were conducted. At some advance ratio, the forward part of the rotor wake, after impinging on the ground, rolls up and recirculates near the rotor leading edge and large increase in induced velocity appears near the rotor leading edge. When the advance ratio increases, the rolled-up wake develops into concentrated vortex, ground vortex, under the rotor and the induced velocity near the rotor leading edge becomes much smaller. The ground vortex diminishes as the advance ratio further increases. Recirculation and ground vortex occur in a very narrow region of the advance ratio. These results explain the irregular variations of rotor forces and moments with advance ratio reported in previous works.

Keywords:

Received 1988-11-03;

引用本文:

孙茂; H.C.Curtiss. 贴地飞行时旋翼空气动力学实验研究[J]. 航空学报, 1989, 10(9): 413-419.

Sun Mao; H. C. Curtiss. AN EXPERIMENT STUDY OF ROTOR AERODYNAMIC IN GROUND EFFECT AT LOW SPEED[J]. Acta Aeronautica et Astronautica Sinica, 1989, 10(9): 413-419.

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