

Abstract Submitted
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The Unsteady Wake Generated by a Rotor in Ground Effect¹

DEVI PULLA, A.T. CONLISK, The Ohio State University — Helicopters flying close to the ground encounter many handling qualities problems. Large unsteady forces near the main and tail rotors are believed to be a major cause of these problems. We investigate the structure of the unsteady wake generated by multibladed rotors in ground effect. A vortex lattice method with a free wake model is used to simulate the tip-vortex and the method of images is used to model the ground and the blades are modeled using the lifting surface method. The rotor wake is advanced in time until periodicity is attained. Unsteadiness in the form of instantaneous velocities is studied at different planes on the advancing and retreating sides of the tail rotor to identify the plane with the maximum unsteadiness. The root-mean-square of the deviation of the instantaneous velocity from the time averaged velocity over a given period is used to quantify the unsteadiness

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