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**Adaptation of the Leishman-Beddoes Dynamic Stall Model for Reverse Flow** ANDREW LIND, ANYA JONES, University of Maryland — The Leishman-Beddoes dynamic stall model has long been used for the prediction of unsteady airloads acting on rotorcraft and wind turbines. However, little work has been completed that attempts to model the unsteady airloads experienced by a blade in the reverse flow region of a high advance ratio rotor. The present work describes modifications to the Leishman-Beddoes model and evaluates its suitability for the prediction of unsteady airloads for a sinusoidally oscillating NACA 0012 in reverse flow. Specifically, the ability of the model to capture early dynamic stall vortex formation (due to the sharp aerodynamic leading edge) and delayed reattachment is assessed. Results from the modified Leishman-Beddoes model are compared to measured unsteady pressure distributions for reduced frequencies up to 0.511 and a maximum pitch angle of 25 degrees. The model is also evaluated against numerical simulations of reverse flow dynamic stall where complete pressures distributions (and thus unsteady airloads) are available. This work is foundational for the development of more complex low-order models of the reverse flow region of a high advance ratio rotor where the time-varying local freestream and spanwise flow are also expected to play an important role.

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