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**Dynamic stall development in the near-root region of a model wind turbine blade** MATTHEW MELIUS, RAUL BAYOAN CAL, Portland State University, KAREN MULLENERS, Leibniz Universität Hannover — The dynamic behavior of atmospheric flows create highly variable operational conditions which affect the life expectancy of the turbine components and the power output of the turbine. To gain insight into the unsteady aerodynamics of wind turbine blades, wind tunnel experiments were conducted with a scaled three-dimensional NREL 5MW wind turbine blade model in the 2.2m x 1.8m cross-section closed loop wind tunnel DLR in Göttingen. The development of dynamic stall in response to a sudden change in the blades angle of attack are studied by means of time-resolved stereoscopic PIV in span-wisely distributed planes capturing the suction side of the blade. The change in angle of attack was obtained by varying the blade pitch angle to simulate a sudden change in wind speed or pitch angle regulation. Resulting time scales associated with flow separation and reattachment are determined at different radial positions ranging from $r/R = 0.19$ to $r/R = 0.38$. The influence of the three-dimensionality of the blade geometry on the corresponding aerodynamic effects is captured by analyzing the radial flow component in neighboring measurement fields during stall development.

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