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**Identification of Flow Structures in a Stratified Wind Turbine Array Boundary Layer** MATT MELIUS, ZACHARY WILSON, ELIZABETH CAMP, RAÚL BAYOÁN CAL, Portland State University — Turbulent structures contained within a thermally stratified flow field as they convect through a wind turbine array are identified using instantaneous velocity fields obtained *via* particle image velocimetry (PIV). The experiment is conducted by placing a 3 by 3 scaled model wind turbine array in the test section of a wind tunnel. Using an active grid, strakes, and a thermally controlled tunnel floor, the conditions of a stratified atmospheric turbulent boundary layer are reproduced. Neutral and unstable conditions are compared. Vortical structures are captured both upstream and in the wake of the center turbine in the last row. The behaviors of the structures and how these evolve downstream are analyzed and compared to statistical quantities of the flow. Understanding these structures can prove important in determining the overall behavior of the flow and impact of the wind turbine array on the local environment.

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