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Power measurements on a stratified 3 × 3 wind turbine array DOMINIC DELUCIA, NICHOLAS HAMILTON, RAÚL BAYOÁN CAL, Portland State University — Extracting energy out of the wind is the ultimate goal of wind turbine technology and understanding its variation due to the local environment is of interest. Power measurements are carried out in a wind turbine array boundary layer. Measurements are done independently using a torque sensing device which employs strain gages to measure it; following the design of Kang & Meneveau (2010).[1] The power curves are obtained based on a three by three array submerged in an atmospheric turbulent boundary layer, which is generated through the use of roughness elements, an active grid and spires. The power measurements are acquired for the turbines in the array while modifying the local environment. This is done using a thermal floor where an unstable boundary layer is created and then compared with a neutral case.

[1]H. S. Kang and C. Meneveau (2010), Meas. Sci. & Tech. 21, 105206.

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