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Field experiment of wind farm power optimization through wake steering[1] MICHAEL HOWLAND, SANJIVA LELE, JOHN DABIRI, Stanford University — Due to greedy individual wind turbine operation, aerodynamic wakes reduce total wind farm power production, thereby increasing the cost of electricity for this resource. Considering the wind farm as a collective, we designed a wake steering control method to increase the power production of wind farms. The method was tested in a multi-turbine array at an operational wind farm where it statistically significantly increased the power production. The analytic gradient-based wind farm power optimization methodology developed can optimize the yaw misalignment angles for large wind farms on the order of seconds.

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