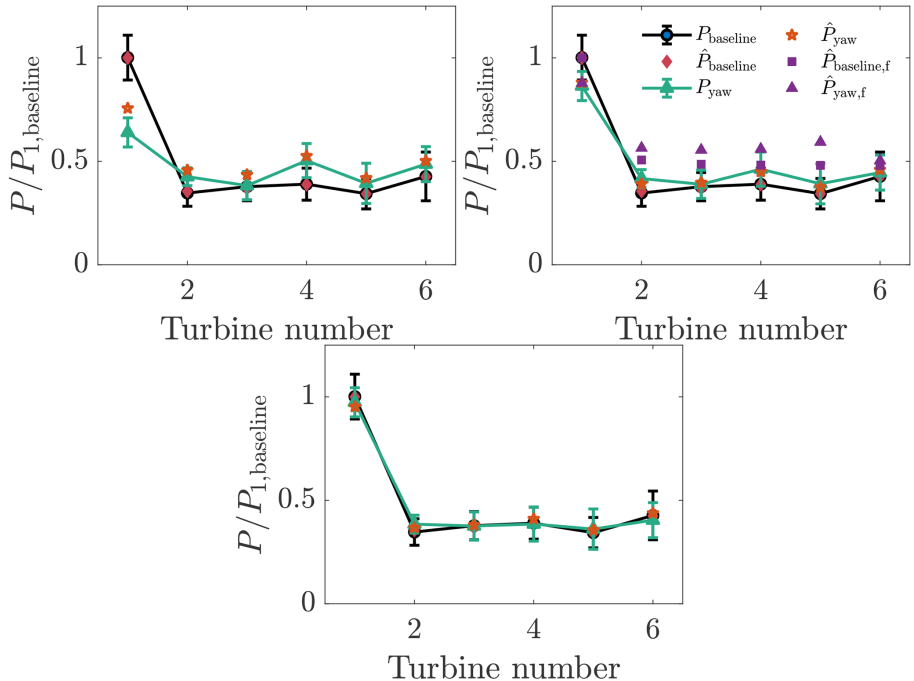

Figure 21. Wind turbine power production from LES P and wake model $\hat{P}$. $P_{1,\text{ baseline}}$ is the LES power production for the leading upwind turbine from control update step 1 where the wind farm is operated with the greedy baseline control. $\hat{P}_{\text{baseline}}$ is the wake model fit to P_{baseline} using EnKF estimation. P_{yaw} is the LES power production for control update step 2 with yaw misalignment incorporated. $\hat{P}_{\text{yaw}}$ is the wake model prediction of P_{yaw} using k_{w} and σ_0 fit based on control update step 1 and with the optimal yaw misalignment angles which were implemented by control update step 1. The wake model estimate for P_{p}, given by $\hat{P}_{\text{p}}$, is **(a)** $\hat{P}_{\text{p}} = 2$, **(b)** $\hat{P}_{\text{p}} = 3$, and **(c)** $\hat{P}_{\text{p}} = 4$. The error bars represent 1 standard deviation in the power data as a function of time. The subscript "f" denotes power predictions from the FLORIS wake model (Annoni et al., 2018) with the Gaussian wake model (Bastankhah and Porté-Agel, 2014) and model parameters prescribed by Niayifar and Porté-Agel (2016).