

Power Grids and Turbulence -- On the stability and quality of power grids subjected to intermittent feed-in

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Feed-in fluctuations are one of the major challenges for future electrical power grids. Short-term fluctuations on the second and sub-second scale are not compensated by standard load balancing mechanisms. Due to the turbulent nature of the generation process, especially the feed-in fluctuations from wind power are strongly non-Gaussian with intermittent increment statistics. We focus on short term wind power fluctuations with realistic properties: temporal correlation, power spectrum, and intermittent increments. We discuss the implications on power system stability in terms of noise-induced desynchronization. Furthermore, we show that the turbulent nature of wind significantly reduces power quality as it is directly transferred into the fluctuations of frequency and voltage.

Cancelled
Will be caught up in spring/summer 2017

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**MPIDS, Prandtl lecture hall, building AI,
Am Faßberg 11, Göttingen**

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