

## **Real time event detection and dynamic model identification using PMU data**

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### Abstract:

The University of California, San Diego (UCSD) microgrid control system includes PMU measurements at the point of common coupling to the area power system (San Diego Gas and Electric). Measurements include data on both sides of the 69kV/12kV main transformers as well as from buildings located at various points on campus including the Scripps Institution of Oceanography located the far western edge of the campus. The PI system collects real time data from the PMUs, computes real time angle differences and automatically detects real time events. This paper outlines an event detection mechanism based on adaptive moving average and rate of change filtering as well an on-line method of automatically determining the dynamic characteristics of the microgrid. The results show that the microgrid has less than desired damping at certain critical frequencies. A control system is proposed that could dampen the oscillations using battery based local energy storage systems on campus.