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Hybrid State Estimation using PMU data and Distributed Compressive Sensing

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In this poster, a hybrid state estimation (HSE) method is proposed for the integration of Phasor Measurement Unit (PMU) data into conventional weighted least square state estimators. PMU measurements are not easily compatible with conventional state estimators because PMUs provide different measurement types at a much faster rate than SCADA measurements. However, the vast majority of state estimators are SCADA-based and they cannot utilize PMU data. In the proposed method, PMU data are converted into the SCADA form based on their statistical properties, and the difference between the refreshing rates is compensated using the distributed Compressive Sensing (CS) which exploits the spatial-temporal correlation of PMU data. Simulations are carried out on the IEEE 14- and 57-bus systems to evaluate the proposed hybrid SE. The simulation results are used to discuss the pros and cons of the proposed method.

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