Islanding detection and localization in Jiangsu Grid

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Background and motivation:
• Develop a real time islanding event detection and localization application
• Test and validate with high density PMU measurements
• Evaluate impacts of PMU data quality issue

Technical approach:
• Analyze islanding detection performance with field measurements
• Develop an robust algorithms for real time application

Conclusion:
• Develop a real time islanding event detection and localization application
• Analyze the impacts of data quality issues
• The progress is delayed due to COV19 virus

Fig. 1. Map of PMU deployment in Jiangsu grid
Figure 2. Recent reported data quality issue types
Islanding event detection algorithm

Frequency difference (FD):

\[ FD_i(t) = |f_i(t) - f_{ref}(t)| \quad 0 < i \leq N \]

Integration of frequency deviation (IOFD):

\[ IOFD_i = \sum_{t_1 \leq t \leq t_2} FD_i(t) \]

![Flow chart of the islanding detection](image)

**Fig. 3.** Flow chart of the islanding detection

Designed test scenarios

Simulation event cases in Jiangsu grid:
• Tune threshold of FD and IOFD
• Guarantee the accuracy of the application

Ambient cases in Jiangsu grid:
• Test identified data anomaly in Jiangsu grid
• Evaluate the impacts of the data anomaly to the applications
• Guarantee the robust of the application

Fig. 4. Erroneous pattern example
Fig. 5. Random spike example
Fig. 6. Missing point example
Fig. 7. High-frequency noise example
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