

## Robust Fault Diagnosis for Wind Turbine Systems Subjected to Multi-Faults

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**Abstract :** Operations, maintenance and reliability of wind turbines have received much attention over the years due to rapid expansion of wind farms. This paper explores early fault diagnosis scale technique based on a unique scheme of a 5MW wind turbine system that is optimized by genetic algorithm to be very sensitive to faults and resilient to disturbances. A quantitative model based analysis is pragmatic for primary fault diagnosis monitoring assessment to minimize downtime mostly caused by components breakdown and exploit productivity consistency. Simulation results are computed validating the wind turbine model which demonstrates system performance in a practical application of fault type examples. The results show the satisfactory effectiveness of the applied performance investigated in a Matlab/Simulink/Gatool environment.

**Keywords :** disturbance robustness, fault monitoring and detection, genetic algorithm, observer technique

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