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## FAULT TOLERANT CONTROL FOR WIND TURBINE PITCH ACTUATORS

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**Summary:** The feasibility of high value structures such as wind turbines (WTs) depends, among other factors, on maintenance costs. Thus, research into methods of fault detection and isolation (FDI) as well as fault tolerant control (FTC) are the crux of the matter to extend operating periods, minimizing downtime and maximizing productivity of WTs [1]. The past few years have seen a rapid growth in interest in wind turbine FDI and FTC. For instance, references [2] and [3] provide overviews of condition monitoring systems.

This paper develops a FDI and active FTC of pitch actuators in WT. This is accomplished combining a disturbance compensator with a controller. The compensator has a dual purpose: to reconstruct the actuator fault and to design the discrete-time controller to obtain an active FTC. That is, the actuator faults are reconstructed and then the control inputs are modified with the reconstructed fault signal to achieve a FTC in the presence of actuator faults with a comparable behavior to the fault-free case. The proposed techniques are validated using the aeroelastic wind turbine simulator FAST [4], which is designed by the U.S. National Renewable Energy Laboratory and widely used for studying wind turbine control systems.

### References

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