

# **Abstract**

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## **Sensor-less MPPT for PMSG Micro Wind Turbines based State Flow**

The field of small scale distributed wind energy generation features noticeable concern regarding the utilization of direct driven permanent magnet synchronous generators (PMSGs). The quality of the output power from a wind turbine generator is mainly dependent on how the maximum power point is tracked. Classical hill-climbing maximum power point tracking (MPPT) techniques exhibit inherit oscillation/settling time trade-off. Wind MPPT process can be considered as an event driven problem. This paper proposes a Stat-Flow based Hill Climbing Searching (HCS) wind MPPT as a competitive technique. The presented technique features simplified implementation, more degree-of-freedom, controllable event timing. Those features contribute to enhance the MPPT process by minimizing the steady-state power oscillations and improve the transient performance. Rigorous simulations are carried out to examine the proposed technique under various wind speeds and power levels to validate the technique's effectiveness.