



# Fault Detection Technique for Inverter controls

**A Control scheme in inverter-based resources (IBR) to simulate synchronous machines in unbalanced faults.**

**IP Status:** Issued US Patent; Issued Patent No. 12,095,257

## Applications

- Inverters for Renewable power generation (photovoltaic (PV), wind)

## Technology Overview

Existing inverters of utility-scale renewable resources, such as solar and wind, operate differently during unbalanced faults than the synchronous generators of conventional power plants. With the increasing penetration of inverter-based resources (IBR), the existing protection schemes using commonly used protection relays will have significant limitations..

Researchers at the University of Minnesota have developed a relay management system technology for use in renewable/inverter-based energy applications. The system identifies faults and imbalances and then injects the appropriate currents to make the relays work in the existing transmission-protection infrastructure. This provides advantages of: (a) leveraging existing transmission-protection infrastructure and, (b) entailing a relatively simple implementation at the source of the problem (at the IBRs).

## Phase of Development

**TRL: 3-4**

Currently in a concept stage, progressing towards a lab demonstration

## Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

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## Researchers

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## Technology ID

2020-135

## Category

Engineering & Physical Sciences/Design Specifications  
Engineering & Physical Sciences/Instrumentation, Sensors & Controls

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