



Empowering Smart Grids: Cost-Optimized Partial Discharge Monitoring with Cloud-Based Analytics

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Objective – This work introduces a non-invasive, plug-and-play system for monitoring partial discharges (PD) in medium-voltage meshed networks. By leveraging advanced sensing and cloud-based processing, the system aims to enhance grid reliability, optimize maintenance strategies, and significantly reduce operational costs for scaled network deployments.

Findings – The system integrates real-time data acquisition, adaptive denoising, and cloud analytics to provide actionable insights into grid health. Its wireless synchronization and AI-driven diagnostics enable precise PD detection and localization, ensuring swift interventions while minimizing false alarms.

Originality – Designed for seamless integration, the solution combines cutting-edge algorithms with scalable architecture, making it ideal for urban and industrial grids. Its cost-efficient, cloud-powered processing sets a new benchmark in grid monitoring, empowering utilities to future-proof their networks and achieve greater efficiency in energy distribution.

Keywords - Partial discharge, medium-voltage networks, plug-and-play systems, cloud-based processing, grid optimization, scalable architecture, AI diagnostics, cost-efficient solutions.