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(G*) FORMOSA - Looking Forward to Millicharged Dark Sectors at the LHC

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We identify potentially the world's most sensitive location to search for millicharged particles in the 10 MeV to 100 GeV mass range: the forward region at the LHC. We propose constructing a scintillator-based experiment, FORward MicrOcharge SeArch (FORMOSA) in this location, and estimate the corresponding sensitivity projection. FORMOSA, placed $\sim 500\,\mathrm{m}$ downstream from ATLAS, would take advantage of enhanced MCP production in the forward direction. We show that FORMOSA can discover millicharged particles in large and unexplored parameter space, and study strongly interacting dark matter that cannot be detected by ground-based direct-detection experiments. The newly proposed LHC Forward Physics Facility (FPF) provides an ideal structure to host the full FORMOSA experiment.

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Authors: Mr FOROUGHI-ABARI, Saeid (University of Victoria); Dr KLING, Felix (SLAC); Dr TSAI, Yu-Dai (Fermilab)

Presenter: Mr FOROUGHI-ABARI, Saeid (University of Victoria)

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