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Physics opportunities at nuSTORM LUIS ALVAREZ RUSO, IFIC University of Valencia, Spain, SILVIA PASCOLI, IPPP, University of Durham, UK, NUSTORM COLLABORATION — The intense beam of muon and electron neutrinos with precisely known energy distributions provided by the stored-muon facility (nuSTORM) is bound to have a significant impact in our understanding of the fundamental properties of neutrinos and their interactions. The precision goals of the oscillation program require a realistic modeling of neutrino-nucleus scattering dynamics. Critically, nuSTORM can contribute to this effort by providing the ultimate experimental program of scattering measurements. Especially appealing are the prospects for new precise direct or indirect measurement of cross sections on single nucleons. The cross section for the scattering on complex nuclei is sensitive to energy and momentum transfers. Data with both muons and electrons in the final state are therefore very valuable. Sensitivity to physics beyond the Standard Model (BSM) is provided by nuSTORMs unique features. This allows sensitive searches for short-baseline flavor transitions, light sterile neutrinos, nonstandard interactions, and non-unitarity. In synergy with the scattering program, new physics searches would also profit from measurements of exclusive final states, allowing for BSM neutrino interactions to be probed in neutrino-electron scattering and by searching for exotic final states

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