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Dynamical Many-Body Localization in a System of Coupled Relativistic Kicked Rotors EFIM ROZENBAUM, VICTOR GALITSKI, University of Maryland, College Park — A periodically-driven rotor is a prototypical model that exhibits a transition to chaos in the classical regime and dynamical localization (related to Anderson localization) in the quantum regime. In a recent preprint, `arXiv:1506.05455`, Keser *et al.* considered a many-body generalization of coupled quantum kicked rotors, and showed that in the special integrable linear case, the dynamical localization survives interactions. By analogy with many-body localization, the phenomenon was dubbed dynamical many-body localization (DMBL). In the present work, we study a non-integrable model of coupled quantum relativistic kicked rotors. Our analysis of such coupled "kicked" Dirac equations indicates that DMBL can exist for generic, non-integrable systems. We also analyze quantum dynamics of the model, which for certain select values of model's parameters exhibits highly unusual behavior – e.g., superballistic transport and peculiar spin dynamics.

Efim Rozenbaum
University of Maryland, College Park

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