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Exploring the electromagnetic properties of neutrinos at a short-baseline reactor neutrino experiment

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Upcoming and present reactor neutrino experiments offer a compelling avenue to probe fundamental neutrino properties beyond flavor oscillations. In this talk, I will discuss the physics potential of a short-baseline reactor experiment, inspired by the JUNO-TAO configuration, to investigate neutrino electromagnetic interactions via electron–neutrino elastic scattering ($E\nu\text{ES}$). I will present the expected sensitivity to the weak mixing angle, $\sin^2 \theta_W$, and to the neutrino charge radius. Furthermore, I will show projected limits on the effective neutrino magnetic moment, μ_ν . Compared to existing reactor neutrino constraints, this experimental setup can achieve competitive and in some cases, leading limits on the electromagnetic properties of neutrinos.

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