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Isotope shifts of Nd^+ in a cryogenic neutral plasma NISHANT BHATT, KOSUKE KATO, AMAR VUTHA, University of Toronto — Measurements of isotope shifts of optical transitions in heavy atoms can shed light on nuclear properties, and potentially probe new physics beyond the standard model. We report measurements of the isotope shifts of two optical transitions in Nd^+, across a series of five zero-spin isotopes that spans the nuclear shape transition. The measurements take advantage of the high optical densities of Nd^+ ions that can be produced in a cryogenically cooled neutral plasma, which enabled us to precisely measure the isotope shifts of these optical transitions for the first time. The bound on the nonlinearity of the King plot constructed from the isotope shifts could inform searches for new physics. We will discuss the future prospects for ultra-precise optical measurements of isotope shifts in Nd^+.

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