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Constraints on new bosons from Isotope shift measurements in Ca+

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By combining high-resolution spectroscopy of the 3d 2 D 3/2 3d 2 D 5/2 interval with an accuracy of 20 Hz using direct frequency-comb Raman spectroscopy with isotope shift measurements of the 4s 2 S 1/2 3d 2 D 5/2 transition in all stable even isotopes of A Ca + (A = 40, 42, 44, 46, and 48), we have been able to carry out a King plot analysis with unprecedented sensitivity to coupling between electrons and neutrons by bosons beyond the Standard Model. Furthermore, we estimate that by improved spectroscopic techniques available, King plots based on data from spectroscopy on either Ca + , Ba + and Yb + ions should be able to produce sensitivity to such potentially new bosons, which surpass other current methods in a broad mass range of 10 to 10 8 eV/c 2.