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Rotational spectroscopy of BaF[1] RICHARD MAWHORTER, GRACESON AUFDERHEIDE, ALEXANDER PRESTON, WILLIAM BALLARD, Pomona College, JENS-UWE GRABOW, Leibniz Universitaet — Barium fluoride (BaF) is one of the heaviest molecular candidates for effective laser cooling, and as such BaF is being employed in eEDM, anapole and a variety of other experiments in a number of laboratories worldwide. Beyond the relevant recent BaF optical spectroscopy study by Steimle, et al., the purpose here is to extend and complement the existing microwave spectroscopy data for BaF. We will present high-resolution (˜1 kHz) data for the N = 1-0 and 2-1 transitions in the vibrational ground state for the five most abundant stable Ba isotopes. This reflects an improvement in resolution of a factor of 20 or more, and direct ablation of barium metal in the presence of a fluorine-containing buffer gas has enabled the first microwave observations of low abundance ^{135}BaF (6.6%) and ^{134}BaF (2.4%). A comparison of the resulting molecular parameters for the two odd barium isotopologues ^{137}BaF and ^{135}BaF (both I = $^{3}/_{2}$) will be highlighted, in the context of the goal of a robust global fit of all the microwave data, which includes transitions up to N = 22-21 and vibrational states up to v =4.

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