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Coulomb Excitation of Pear-shaped Nuclei

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We have carried out measurements, using Miniball, of the γ -ray de-excitation of $^{222,228}\text{Ra}$ and $^{222,224,226}\text{Rn}$ nuclei Coulomb-excited by bombarding ^{60}Ni and ^{120}Sn targets. The beams of radioactive ions, having energies of between 4.25 and 5.08 MeV.A, were provided by HIE-ISOLDE. The purpose of these measurements is to determine the intrinsic quadrupole and octupole moments in these nuclei and look for other cases of permanent octupole deformation to those of $^{224,226}\text{Ra}$ already reported^{1,2}. One aim of this experiment is to determine the level schemes of $^{224,226}\text{Rn}$ in order to characterise these isotopes as octupole vibrational or octupole deformed. We present here the preliminary results of this analysis which suggests that radon even-even nuclei in this mass region are all octupole vibrational. The implications for EDM searches in radon atoms will be discussed.

¹ Gaffney L P et al. 2013 Nature **497** 199

² Wollersheim H J et al. 1993 Nuclear Physics A **556** 261

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