

Is the electron round?

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We have made a new measurement of the electron's electric dipole moment (EDM) using a beam of YbF molecules.¹ By measuring atto-eV energy shifts in a molecule, this experiment probes new physics at the tera-eV energy scale. According to the standard model, this EDM is $d_e \approx 10^{-38} e \cdot \text{cm}$ – some eleven orders of magnitude below the current experimental limit. However, most extensions to the standard model predict much larger values, potentially accessible to measurement². Hence, the search for the electron EDM is a search for physics beyond the standard model. I will describe our experimental method, our current results and their implications for particle physics. I will also outline the prospects for further major improvement in sensitivity.

¹ J. J. Hudson, D. M. Kara, I. J. Smallman, B. E. Sauer, M. R. Tarbutt, E. A. Hinds “Improved measurement of the shape of the electron”, *Nature* **473**, 493 (2011). doi:10.1038/nature10104

² E. D. Commins, *Electric dipole moments of leptons*, in *Advances in Atomic, Molecular, and Optical Physics*, Vol. 40, B. Bederson and H. Walther (Eds.), Academic Press, New York, pp. 1-56 (1999).