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A precision measurement of the electron's electric dipole moment using trapped molecular ions[1]

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Alongside high energy colliders, precision tests of fundamental symmetries in low energy systems present a complementary path toward evidence for microscopic physics beyond the Standard Model of particle interactions (SM). Among these, permanent electric dipole moment searches are promising, due to the strong motivation to search for sources of charge-parity (CP) symmetry violation beyond the SM, and due to their very low background within the SM. I will describe a recent measurement of the electron's electric dipole moment (eEDM, d_e) using $^{180}Hf^{19}F^+$ molecular ions confined in a radiofrequency trap, and our progress towards a second generation measurement with an order of magnitude higher sensitivity. In addition to providing confirmation of the present upper limit on d_e, it is the first eEDM measurement to demonstrate coherence times >1 second in a molecular system —a feature that will be valuable in the highest precision future eEDM searches.

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