Interpreting the Electron EDM Constraint

QIANSHU LU, CARI CESAROTTI, Harvard University, YUICHIRO NAKAI, Rutgers University, ADITYA PARIKH, MATTHEW REECE, Harvard University — The ACME collaboration has recently announced a new constraint on the electron EDM, $|d_e| < 1.1 \times 10^{-29} \, e\, \text{cm}$. This is a powerful constraint on CP-violating new physics: even new physics generating the EDM at two loops is constrained at the multi-TeV scale. I will interpret the electron EDM bound through first a general order-of-magnitude analysis, then discussions of two specific scenarios: one is SUSY, where new physics involves the electroweak sector and couples to the Higgs. The other is the "QULE operators", $(q_f \bar{u}_f) \cdot (\ell \bar{e}_e)$, where new physics couples to the charm or top quark. The electron EDM bound is the leading constraint on a wide variety of theories of CP-violating new physics. I will also briefly discuss the implications of future improvements in EDM searches.

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Date submitted: 29 Jan 2019
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