Teach a physicist

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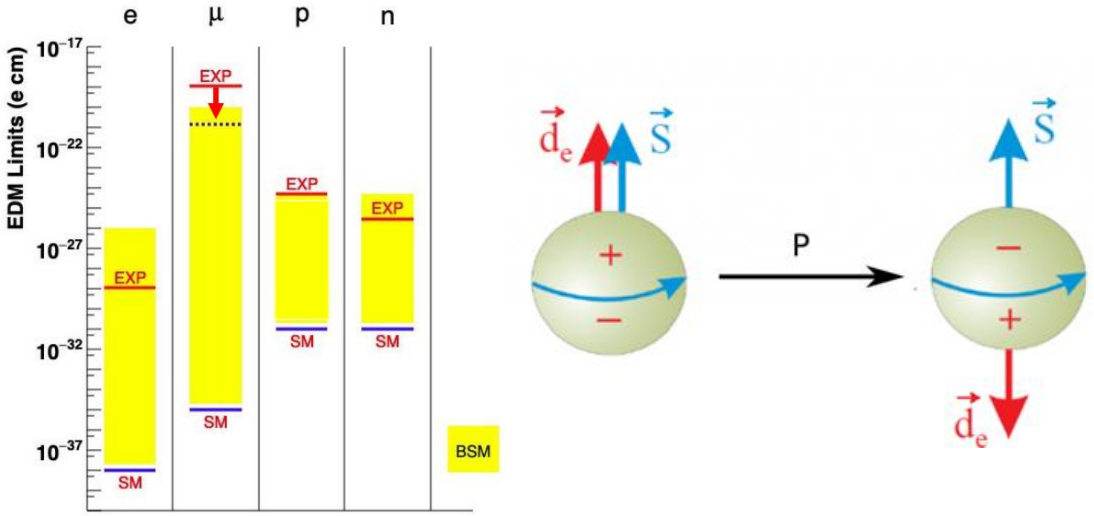
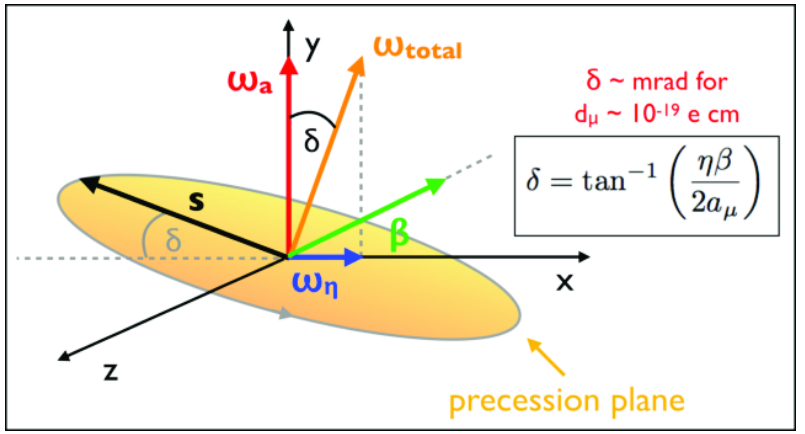
LEVERHULME TRUST

Katie taught me: EDM @ FNAL

1. Search for a muon EDM signal → New source of CP-violation!

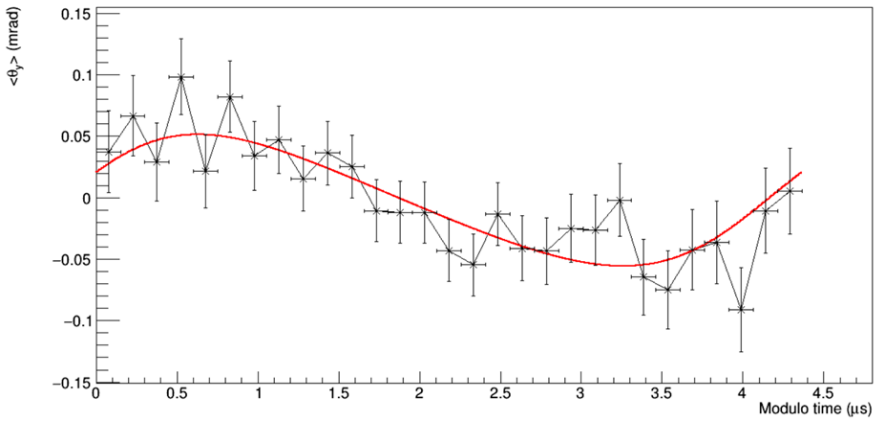


2. EDM → tilt of precession plane by angle δ



EDM:

$$\vec{d} = \eta \frac{Qe}{2mc} \vec{S}$$



3. Measurement principle: e^+ are emitted towards muon spin → measure average vertical angle vs time

4. Current limit: $\sim 1.8 \times 10^{-19} \mathrm{e} \cdot \mathrm{cm}$

Lorenzo taught me: PrecisionSM database

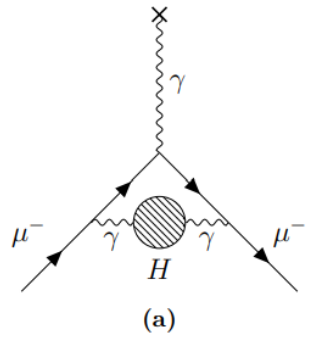
STRONG2020 → RadioMonteCarLow2:
A sub-goal is to make a database with easy to find results and data for users to do their own analysis

Database:

- The name of the experiment, the channel analysed, the published papers, the tables from the papers with plotting tools
- Superceded data is also stored

Database for $e^+e^- \to \pi^+\pi^-$ channels

Experiment	Year	Reference (link to INSPIRE-HEP)	Link to Hepdata	Details	Status
BESIII (BEPC, Beijing)	2016	Phys.Lett.B 753(2016) 629-638 [errata: Phys.Lett.B 812 (2021) 135982]	ins1385603	details	Finalized
BaBar (SLAC, Stanford U.)	2012	Phys.Rev.D 86 (2012) 032013	ins1114155	details	Finalized



The database contains the e+e- -> hadrons experiments, these contribute to the SM calculation of g-2
The SM HVP calculation is done by integrating the cross section of e+e- ->hadrons * kernel factor (as a function of centre of mass energy, s)