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Searches for electric dipole moments (EDM) - Overview of status and new experimental efforts

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Searches for permanent electric dipole moments (EDMs) of fundamental particles, atoms and molecules are promising experiments to constrain and potentially reveal beyond Standard Model (SM) physics. A non-zero EDM is a direct manifestation of time-reversal (T) violation, and, equivalently, violation of the combined operation of charge-conjugation (C) and parity inversion (P). Identifying new sources of CP violation can help to solve fundamental puzzles of the SM, eg. the observed baryon-asymmetry in the Universe.
Theoretical predictions for magnitudes of EDMs in the SM are many orders of magnitude below current experimental limits. However, many theories beyond the SM require larger EDMs. Experimental results, especially when combined in a global analysis, impose strong constraints on CP violating model parameters.
Including an overview of EDM searches I will focus my presentation on the future neutron EDM experiment at TRIUMF (Vancouver). For this effort the TUCAN (TRIUMF Ultra Cold Advanced Neutron source) collaboration is aiming to build a world leading source of ultra cold neutrons based on an unique combination of a spallation target and a superfluid helium converter.
Another focus will be the search for an EDM of the diamagnetic atom 129-xenon using a 3-helium comagnetometer and SQUID detection. The HeXeEDM collaboration is anticipating to take EDM data this year in the magnetically shielded room at PTB Berlin. Results from previous test runs at PTB Berlin and FRM-II in Munich will be presented.

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