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Determination of the electric dipole moment of heavy Λ and Λ_c^+ baryons in electron-positron annihilation

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The Universe is dominated by matter over antimatter. To theoretically explain this effect, a strong violation of CP symmetry is necessary. The currently available sources of CP symmetry breaking are not sufficient for this purpose. Therefore, the search for new sources of breaking this symmetry is a very important area of research today. One such possible source could be the electric dipole moment (EDM) of heavy baryons. In this paper, we discuss a method for determining the baryon EDM from the angular distribution of final particles in electron-positron pair annihilation processes. The question is raised with what accuracy modern experiments can determine the electric dipole moment Λ and Λ_c^+ baryons.
Using the Monte Carlo method, pseudo-statistics of the above events were generated with a volume corresponding to the current BESIII experiment (China) and the future STCF (Super Tau-Charm Facility, China). Then, using the obtained pseudo-data, the error of measurement of the distribution parameters of these events is calculated. From these errors, the sensitivity of the measurement of the electric dipole moment of heavy Λ and Λ_c^+ baryons are directly calculated.
For the Λ baryon in the BESIII experiment, the calculated sensitivity for the electric dipole moment was 10^{-18} $e \cdot cm$, the same figure for the STCF experiment was of the order of 10^{-20} $e \cdot cm$. For the Λ_c^+ baryon, the calculated sensitivity for the EDM in the STCF experiment was 10^{-16} $e \cdot cm$.

Authors: Mr OVSIANNIKOV, Roman (V. N. Karazin Kharkiv National University, NSC «Kharkov Institute of Physics and Technology»); Dr KORCHIN, Alexander (V.N. Karazin Kharkiv National University, NSC «Kharkov Institute of Physics and Technology»); Dr KOU, Emi (Universite Paris-Saclay, CNRS/IN2P3, IJCLab, 91405 Orsay, France)

Presenter: Mr OVSIANNIKOV, Roman (V. N. Karazin Kharkiv National University, NSC «Kharkov Institute of Physics and Technology»)

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