

Coulomb interaction in rare lepton and semilepton decays of neutral B mesons

Wednesday 30 October 2024 15:50 (15 minutes)

We present a method to account for the Coulomb interaction in the ultra-rare leptonic decays $B_{s,d}^0 \rightarrow \ell^+ \ell^-$ and rare semileptonic $B_{s,d}^0 \rightarrow h^0 \ell^+ \ell^-$, where $h^0 = \{K, \pi^0, \eta, \eta'\}$. Taking into account the Coulomb interaction for the decay of $B_s^0 \rightarrow \mu^+ \mu^-$ reduces the discrepancy between theory and experiment more than twice. The main idea of the work is to change the procedure of secondary quantization - instead of expansion by plane waves the solution of the Dirac equation in an external field (Furry picture) is used. The applicability of the Furry picture is justified on the example of the decay of a hypothetical neutral pseudoscalar particle into two charged scalars $B^0 \rightarrow S^+ S^-$.

Primary authors: MANUKHOV, Stepan; NIKITIN, Nikolay (Lomonosov Moscow State University)

Presenter: MANUKHOV, Stepan

Session Classification: Theoretical Physics

Track Classification: Theoretical Physics