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## CP violation in $B^0$ and $\bar{B}^0$ decay and the flavor-tagged $\Delta t$ distributions

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The BABAR experiment shows that the flavor-tagged  $\Delta t$  distribution of  $B^0 \rightarrow J/\Psi K_L^0$  agrees with the theoretical prediction, but that of  $\bar{B}^0 \rightarrow J/\Psi \bar{K}^0$  shows discrepancy at large  $|\Delta t|$  region[1]. The difference could appear from the presence of tree diagrams of  $\bar{B}^0 \rightarrow \bar{K}_L^0 J/\Psi$  but absence corresponding tree diagram of  $B^0 \rightarrow K_L^0 J/\Psi$ , in the Cartan's supersymmetry[2].

The tree diagram could contain retarded time effect before  $J/\Psi$  creation during propagation of the W boson. The model can be extended to the decay of  $B^0 \rightarrow K^+ \pi^-$  and  $\bar{B}^0 \rightarrow K^- \pi^+$  [3], and  $B^0 \rightarrow D^{*-} X \ell^+ \nu$  [4].

The  $Z_3$  symmetry of leptons and quarks[5] suggests that CP violation effects in the  $B^0 \rightarrow D^{*-} X \ell^+ \nu$  cannot be detected by our electromagnetic detectors.

Possibility of detecting the retarded time effect by rapidly moving the detector[6] will be discussed.

[1] B. Aubert et al., (BABAR Collaboration) . Rev. D **79**,(2009) 072009.

[2] S.Furui, Cartan's Supersymmetry and the violation of the CP symmetry, arXiv:1505.05830

[3] J.Bernabeu and F. Martinez-Vidal, Time-reversal violation with quantum-entangled B mesons, Review of Modern Physics **87**,(2015) 165.

[4] J.P. Lees et al., (BABAR Collaboration) Phys. Rev. Lett,**111**,(2013) 101802.

[5] S.Furui, Cartan's Supersymmetry and Weak and Electromagnetic Interactions, arXiv:1502.04524 (v4).

[6] M.Bitbol, l'erreur d'Einstein, La recherche **418**, (2008) p.31

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