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CP and CPT Violation in B decays at Belle

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We present a search for direct CP violation in $B^+ \rightarrow J/\psi K^+$ decays using a large data sample collected at the Upsilon(4S) resonance with the Belle detector operating at the KEKB asymmetric-energy e^+e^- collider. The Standard Model predicts a small direct CP asymmetry, and the experimental precision is of the same level as the expected deviation predicted by some extensions of the Standard Model. We also present measurements of time-dependent CP asymmetries in neutral B decays to charmonium final states, and a measurement of CP-violating parameters in B^0 decays to the $K_S^0 K^+ K^-$ final state, including $B^0 \rightarrow \phi K_S^0$, using a time-dependent Dalitz plot analysis. CPT is expected to be a fundamental symmetry with no significant deviations. Nonetheless we can introduce an artificial perturbation parameter to the B^0 - $\text{anti}\{B\}^0$ mixing system that violates CPT symmetry. The CPT violating parameter, which is a complex number but expected to be zero, can be probed through proper time difference distributions in correlated B meson pair decays. We present a measurement of the CPT violating parameter using the large Belle data sample.

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