Contribution ID: **15** Type: **Poster**

Studying T-violation at Belle II

Monday 7 April 2025 19:40 (20 minutes)

Belle II is a particle detector operating at the SuperKEKB accelerator located in KEK (High Energy Particle Research Organization) in Tsukuba, Japan. The facility collides electrons and positrons at centre of mass energy close to $\Upsilon(4S)$ resonance, which primarily decays into pairs of B mesons. The detector is designed to study light mesons and tau leptons. Entangled pairs of neutral B mesons can be used to study T-violation.

T is a discrete symmetry of space-time where physical processes are invariant under time reversal. At a quantum level the violation of this symmetry, T-violation, may have important implications on our understanding of fundamental physics. As CP and T are equivalent under CPT theorem, T-violation will be able to probe phenomena such as the matter-antimatter asymmetry in the universe. If the magnitude of any CP and T violation differ, then that has deeper ramifications for our understanding of physics.

This talk will provide an overview of the Belle II detector and its role in exploring T-violation through the study of B meson decays, as well as a brief outline of potential future developments in this area of research.

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Session Classification: Poster session

Track Classification: Collider Physics - Flavour