



Canadian Association  
of Physicists

Association canadienne  
des physiciens et physiciennes

Contribution ID: 101 Type: Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)

## (G\*) The Search for Charged Lepton Flavour Violation at Belle II

Wednesday, 9 June 2021 12:10 (10 minutes)

Belle II is a B factory experiment for the SuperKEKB electron-positron collider located at the KEK laboratory in Tsukuba, Japan, operating near the Upsilon(4S) resonance, at an energy of 10.58 GeV. In this talk I will discuss our analysis searching for the ultra-rare charged lepton flavour violating (CLFV) decay  $B^+ \rightarrow K^+ \tau e$ . This decay is far below experimental sensitivity if we assume the decay rate predicted by the Standard Model. However, many extensions of the Standard Model, specifically those attempting to incorporate the recent “B physics anomalies”, predict much larger branching fractions which are potentially within the reach of experiments. Discovery of this mode would be explicit evidence of physics beyond the Standard Model, while a null result would allow us to place strict constraints on these models. A previous search was done at BaBar in 2012, setting a 90% CL upper limit branching fraction of a few  $\times 10^{-5}$ . The much larger integrated luminosity dataset at Belle II can be exploited to improve the analysis sensitivity by at least an order of magnitude. A brief overview of the Belle II experiment and the theoretical aspects of CLFV will be discussed, along with the current status and future potential of our analysis.

**Primary author:** SHILLINGTON, Trevor (McGill University)

**Presenter:** SHILLINGTON, Trevor (McGill University)

**Session Classification:** W1-10 Exploring the Energy and Precision Frontier III (PPD) / Frontière d'énergie et de précision III (PPD)

**Track Classification:** Particle Physics / Physique des particules (PPD)