



Contribution ID: 116

Type: **Parallel talks**

CP Violation in Rare B Decays as a Window to New Physics

Tuesday 18 July 2023 16:20 (20 minutes)

In the pursuit of physics beyond the Standard Model, a promising path is the study of exclusive B-meson decays caused by the transition $b \rightarrow s \ell^+ \ell^-$. A key observable in such decays is the ratio R_K , which measures electron-muon universality in $B \rightarrow K \mu^+ \mu^- / e^+ e^-$. At first sight, the recent LHCb measurement of $R_K \sim 1$ [2303.08764] may seem to largely constrain deviations from universality in these decays. However, this is actually not the case: new sources of CP violation allow for universality violation consistent with $R_K = 1$ [2212.09575]. Another central observable is the branching ratio of the semileptonic decay $B \rightarrow K \mu^+ \mu^-$, which shows a $\sim 4\sigma$ tension between experiment and theory. New physics causing this tension is customarily encoded in the Wilson coefficients C_9 and C_{10} . We discuss a new way to extract CP-violating phases in these coefficients [2212.09575]. We also discuss CP violation in the leptonic decay $B_s \rightarrow \mu^+ \mu^-$, which complements semileptonic decays through its outstanding sensitivity to scalar and pseudoscalar physics. These studies provide exciting new opportunities to search for new physics in rare B-meson decays.

Author: REHULT, Anders (Nikhef / Vrije Universiteit Amsterdam)

Co-authors: Ms MALAMI, Eleftheria (Nikhef / University of Siegen); Dr VOS, Keri (Nikhef / Maastricht University); Prof. FLEISCHER, Robert (Nikhef / Vrije Universiteit Amsterdam)

Presenter: REHULT, Anders (Nikhef / Vrije Universiteit Amsterdam)

Session Classification: Flavour physics: Theory and Experiment

Track Classification: Flavour physics: Theory and Experiment