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Bc -> tau nu at FCC-ee

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Z -pole operation at FCC-ee represents an unprecedented opportunity for heavy flavour physics, as the production of 5×10^{12} Z bosons will result in a sample of 8×10^{11} b -quark pairs. All species of B hadron will be produced at FCC-ee, including the doubly heavy B_c^+ meson. The purely leptonic decays of this meson, which proceed in the Standard Model via annihilation of the \bar{b} and c quarks, have not yet been observed experimentally. The $B_c^+ \rightarrow \tau^+ \nu_\tau$ decay is of particular interest, as its decay rate is highly sensitive to potential New Physics contributions from mediators such as charged Higgs bosons or leptoquarks. A measurement of the $B_c^+ \rightarrow \tau^+ \nu_\tau$ branching fraction at FCC-ee has the potential to rule out large regions of New Physics parameter space, and either confirm or refute the indications of New Physics in $b \rightarrow c \tau \nu_\tau$ transitions. This talk describes a complete feasibility study for the measurement of $\mathcal{B}(B_c^+ \rightarrow \tau^+ \nu_\tau)$ at FCC-ee, where precision estimates are given as a function of the number of Z bosons produced. This work represents the first FCC-ee analysis to use common software tools from EDM4hep through to final analysis.

Author: HILL, Donal (EPFL - Ecole Polytechnique Federale Lausanne (CH))

Presenter: HILL, Donal (EPFL - Ecole Polytechnique Federale Lausanne (CH))

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