

# Prospects of $B_c^+$ and $B^+$ to $\tau^+\nu_\tau$ decays at FCC-ee

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The Z-pole operation at FCC-ee presents an unprecedented opportunity for heavy flavor physics, as the production of  $5 \times 10^{12}$  Z bosons will result in about  $8 \times 10^{11}$  b-quark pairs. Among all species of B hadrons produced at FCC-ee, the purely leptonic decays of the  $B_c^+$  and  $B^+$  mesons are the cleanest experimental probes to measure the off-diagonal CKM elements  $|V_{cb}|$  and  $|V_{ub}|$ , and are highly sensitive to test BSM models such as charged Higgs bosons and leptoquarks. A complete feasibility study of the  $B_c^+$  to  $\tau^+\nu_\tau$  measurement at FCC-ee is performed and its phenomenological impact on various new physics scenario is explored. Recent develops has also been made on the measurement of the  $B^+$  to  $\tau^+\nu_\tau$  decay, demonstrating the feasibility of this measurement with a precision comparable to that of  $B_c^+$ . This set of work also showcases the FCC-ee analysis workflow fully based on common software tools from EDM4hep through to final analysis.

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