

Untagged analysis of $B \rightarrow \pi l \bar{\nu}$ and first measurement of $|V_{ub}|$ at Belle II

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A long standing discrepancy between the results of exclusive and inclusive measurements of the CKM matrix element $|V_{ub}|$ exists. The charmless semileptonic decay $B \rightarrow \pi l \bar{\nu}$ is one of the most accessible and powerful channels for determining $|V_{ub}|$ in exclusive modes at $e^+ e^-$ B-factories. Using data from the Belle II experiment, a new precision measurement of $|V_{ub}|$ becomes possible. In preparation for first precision measurements, an untagged measurement method for extracting $B \rightarrow \pi l \bar{\nu}$ events is developed. Lepton and pion candidates are combined to form $B \rightarrow \pi l \bar{\nu}$ candidates. In order to increase the purity, a series of selections is imposed to suppress continuum and other backgrounds. Signal is extracted from a fit to the two-dimensional ΔE and M_{bc} distribution in bins of the momentum transfer squared of the B-meson to the pion final state. A simultaneous form factor fit to the measured partial branching fractions and lattice QCD input is carried out to determine values of $|V_{ub}|$.

Secondary track (number)

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Yes

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