

## Simultaneous analysis of $B \rightarrow D\ell\nu$ and $B \rightarrow D^*\ell\nu$ to improve the determination of $|V_{cb}|$ .

Tuesday 24 September 2024 11:00 (30 minutes)

We propose a simultaneous analysis of  $B \rightarrow D\ell\nu$  and  $B \rightarrow D^*\ell\nu$  decays to measure model-independent observables for the determination of  $|V_{cb}|$ . The  $B \rightarrow D^*\ell\nu$  decays is partially reconstructed, removing systematic uncertainty on  $|V_{cb}|$  from the soft-pion reconstruction. By assuming equality of the semileptonic decay width of  $B^0$  and  $B^+$  mesons, we can also measure  $f_{+-}/f_{00}$ , the ratio of the branching fractions of the  $\Upsilon(4S)$  decaying into charged and neutral  $B\bar{B}$  pairs. From the model-independent observables,  $|V_{cb}|$  and the form-factor parameters of both decays can be determined *a-posteriori* assuming any form-factor model and lattice data inputs. Using simulation, we present the potential of this analysis with the current Belle II dataset.

**Primary author:** MANTOVANO, Michele (University and INFN Trieste)

**Presenter:** MANTOVANO, Michele (University and INFN Trieste)

**Session Classification:** Heavy to heavy exclusive