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

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We propose a simultaneous analysis of $B \to D\ell\nu$ and $B \to D^*\ell\nu$ decays to measure model-independent observables for the determination of $|V_{cb}|$. The $B \to D^*\ell\nu$ 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 $B\overline{B}$ 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.

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