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Extraction of CKM matrix elements in the single-top t-channel events at 13 TeV with CMS

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The dominant electroweak production mechanism for single top quarks is the t-channel and, it features a tWq vertex, where q stands for b, s, or d quarks, both in production and in decay. For this reason its cross section and branching fractions are sensitive to the strength of the electroweak coupling, making it a suitable channel for direct measurements of the magnitude of Cabibbo-Kobayashi-Maskawa matrix elements $|\mathrm{V_{tb}}|$, $|\mathrm{V_{ts}}|$, and $|\mathrm{V_{td}}|$. A precise determination of the magnitude of these parameters of the Standard Model allows to search for hints of potential contributions from new physics beyond the Standard Model. This poster presents the first direct measurement of the Cabibbo-Kobayashi-Maskawa matrix elements $|\mathrm{V_{tb}}|$, $|\mathrm{V_{ts}}|$, and $|\mathrm{V_{td}}|$, making use of single top quark t-channel events in proton-proton collision data with a centre-of-mass energy of 13 TeV, collected with the CMS experiment at the LHC. The subset of data analysed corresponds to an integrated luminosity of 35.89 fb^{-1}.

Secondary track (number)

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