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New physics solutions for $b \rightarrow c\tau\bar{\nu}$ anomalies after the measurement of D^* polarization

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The anomalies in the flavor ratios R_D and R_{D^*} provide a hint of physics beyond the Standard Model. Previously it was shown that the polarization fraction of the D^* meson in the $B \rightarrow D^* \tau \bar{\nu}$ decay provides a defining signature for tensor new physics. Recently Belle collaboration measured this quantity to be $0.60 \pm 0.08 \pm 0.04$. Here we do a re-analysis of all the data in $b \rightarrow c\tau\bar{\nu}$ sector, including the D^* polarization fraction. We find that the Belle measurement rules out the tensor new physics solutions at 5σ . We also identify the presently allowed new physics solutions and the six variables needed to distinguish between them.

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