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## Search for New Physics with semi-leptonic B Decays at Belle

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### Summary

Semi-leptonic B decays  $B \rightarrow D() \tau \nu$  have been of interest because of the high sensitivity to the New Physics. Recent indication of a discrepancy of  $R(D)$  and  $R(D^*)$  (branching ratio of  $B \rightarrow D() \tau \nu$  over  $B \rightarrow D() l \nu$  where  $l = e, \mu$ ) from the Standard Model prediction can be a hint for the New Physics effect.

In this talk, the new measurement of  $R(D)$  and  $R(D^*)$  based on semileptonically tagged  $B \rightarrow D^* \tau \nu$  decays as well as the first measurement of the  $D^*$  polarization in  $B \rightarrow D^* \tau \nu$  decays are presented.

This talk also covers new Belle search for the purely leptonic decay  $B \rightarrow \mu^+ \mu^- \nu$ .

The analyses are based on the full data set recorded by the Belle detector at the KEKB  $e^+ e^-$  collider containing 772 million  $B\bar{B}$  pair events.

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