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## Measurement of the branching fractions

$$\text{calB}(\tau \rightarrow K n \pi^0 \nu), n = 0, 1, 2, 3, \text{ and}$$

$$\text{calB}(\tau \rightarrow \pi n \pi^0 \nu), n = 3, 4$$

Saturday, July 13, 2019 12:20 PM (20 minutes)

We report the measurements of the branching fractions of the decays  $\tau \rightarrow K n \pi^0 \nu$ ,  $n = 0, 1, 2, 3$ , and  $\tau \rightarrow \pi n \pi^0 \nu$ ,  $n = 3, 4$ . The measurements are based on a data sample of 435 million tau pairs produced in  $e^+e^-$  collisions at and near the  $Y(4S)$  peak and collected with the BABAR detector in 1999–2008. Additional systematic studies have been completed after the presentation of the preliminary results. Most measurements are substantial improvements over previous measurements and  $\text{calB}(\tau \rightarrow \pi 4 \pi^0 \nu)$ , is measured for the first time. These measurements improve the determination of  $|V_{us}|$  from the branching fraction  $\tau^- \rightarrow X_s^- \nu_\tau$  computed as the sum of all measured exclusive modes, with a method based on finite-energy QCD sum rules.

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