



# KCETA Colloquium

## Evidence for a rare $B$ decay with two invisible neutrinos at Belle II

Thursday, November 30, 2023

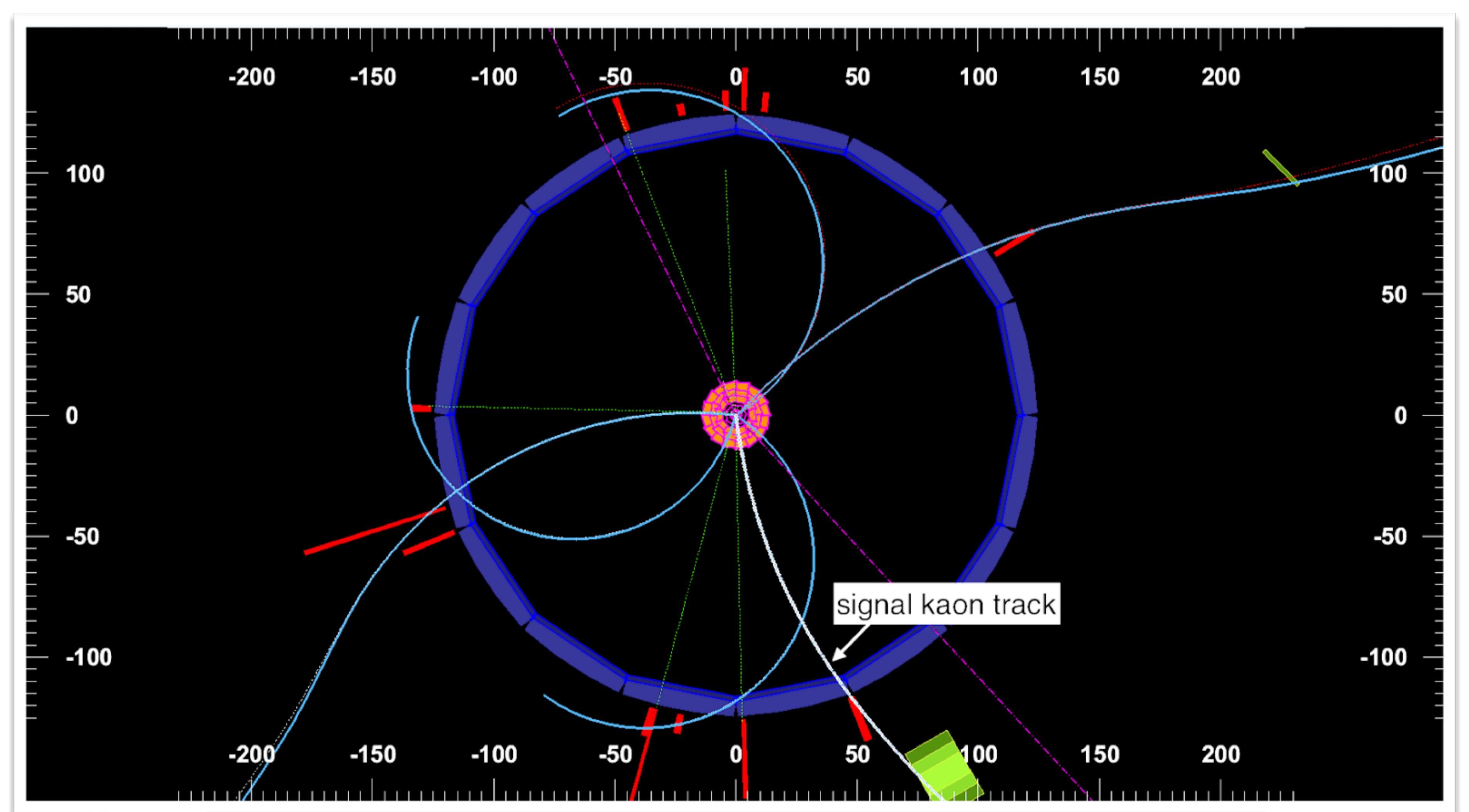
Kleiner Hörsaal A (CS) 15:45 - 17:00

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The decay of  $B^+ \rightarrow K^+ \nu \bar{\nu}$  is mediated by a flavor-changing neutral current. In the Standard Model, the rate for this elusive process is predicted to be  $6 \times 10^{-5}$ , while enhancements are foreseen in many New Physics scenarios. Searching for  $B^+ \rightarrow K^+ \nu \bar{\nu}$  decays is, however, experimentally challenging as these decays are not only rare but also contain two neutrinos, leaving no signature in the detector.

In this colloquium, I will show you details of the newest measurement of the rate of  $B^+ \rightarrow K^+ \nu \bar{\nu}$  decays, which is based on  $362 \text{ fb}^{-1}$  of SuperKEKB  $e^+e^-$  collision data collected at the  $\Upsilon(4S)$  resonance by the Belle II experiment in Tsukuba, Japan. Using two different reconstruction techniques, we found, for the first time, evidence for the  $B^+ \rightarrow K^+ \nu \bar{\nu}$  process. At the end of my talk, I will also highlight future opportunities in  $B$ -decays with invisible signatures.



Please note:

The colloquium will also be live-streamed to Seminarraum 410 in Bld. 401 (CN).