

Precise measurement of the super-rare decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$: the NA62 Experiment at CERN

Dr. Rainer Wanke

Johannes-Gutenberg Universität Mainz

Kaon physics has been one of the key building blocks of the Standard Model and continues to play a fundamental role complementary to the direct searches for New Physics. The ultra-rare decays $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ and $K_L \rightarrow \pi^0 \nu \bar{\nu}$ are among the most sensitive probes of physics beyond the SM. The detection of these decay modes is challenging because the branching ratios are predicted by the SM to be of order 10^{-10} and the two neutrinos cannot be observed. The NA62 experiment at the CERN SPS has been designed for a precise measurement of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ branching fraction. It took data for the first time during a 2-months pilot run end of 2014 and will continue with the completed detector in summer 2015. The seminar will focus on the NA62 experiment status and perspectives with a first look at the 2014 data.