



Contribution ID: 15

Type: **not specified**

$K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay and NP searches at NA62

Friday 1 February 2019 09:30 (30 minutes)

The decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ has a very precisely predicted branching ratio (BR) of less than 10^{-10} and is one of the best candidates to reveal indirect effects of new physics at high mass scales. The NA62 experiment at CERN SPS is designed to measure $BR(K^+ \rightarrow \pi^+ \nu \bar{\nu})$ with in-flight decays, a novel technique for this channel. NA62 took its first physics data in 2016, reaching sensitivity to the decay at the Standard Model BR. The experiment collected 10 times more statistics in 2017 and a similar amount of data is expected from the 2018 run. The result on $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ from the full 2016 data set will be presented and prospects for future improvements will be discussed.

Fixed target experiments are a useful tool in the search for very weakly coupled particles in the MeV–GeV range, which are of interest, e.g. as potential dark-matter mediators. Due to the high beam energy and hermetic detector coverage, NA62 also has the opportunity to directly search for a multitude of long-lived beyond-Standard-Model particles, such as dark photons, dark scalars, axion-like particles, and heavy neutral leptons. The status of these searches will be reviewed together with prospects for future data taking at NA62.

Primary author: MARTELLOTTI, Silvia (INFN e Laboratori Nazionali di Frascati (IT))

Presenter: MARTELLOTTI, Silvia (INFN e Laboratori Nazionali di Frascati (IT))