



## RESEARCH

### NA62 RESEARCH AND THE RARE DECAYS OF THE K-MESON

The NA62 experiment at CERN has recently presented its latest results concerning a very rare event: the decay of the charged K-meson into a pion and two neutrinos. The interest in extremely rare or even "forbidden" decays is motivated by the fact that these processes allow energy scales even much higher than those directly accessible to the most powerful particle colliders, such as the Large Hadron Collider (LHC) at CERN, to be indirectly probed. The study of these decays could therefore open a window in the near future on physics beyond the Standard Model. Moreover, the results just presented by NA62 are also interesting because they demonstrate the effectiveness of the new technique, called "in flight", used by the experiment to investigate these K-meson decays. In the coming years, this will allow the elusive process to be studied with a precision never achieved before. According to theoretical predictions, the charged K-meson decays into a pion and two neutrinos only in a very small fraction of cases. To understand the extreme rarity of this process, the Standard Model foresees, with considerable precision, that only eight decays of this type must occur every one hundred billion decays of the K-meson. In numerous theories that aim to overcome the Standard Model, the fraction of events expected for this decay is instead significantly different: therefore, a sufficiently precise measure could highlight the presence of what physicists call New Physics. The results obtained so far, at this level of statistical precision, are compatible with the Standard Model predictions. ■