

## Exotic states at 22GeV era kaon beams

*Monday, 9 December 2024 12:05 (15 minutes)*

The KLF project aims to discover many new particles in the strange quark sector, elucidate the interaction of strange-quark containing baryons (hyperons) with nucleons and, through the unprecedented Kaon flux of 1 billion Kaons per day enable searches for rare KL decays at new limits. Alongside the hadron physics impact KLF can deliver key data for fundamental astrophysics including a deeper understanding of neutron star composition and of the early universe during the transition from deconfined plasma to hadrons through the strange epoch.

Existing 12GeV KL-Facility is mostly concentrated on low-energy kaon beams to look for single and double-strange hyperons, however there are several topics which require high energy neutral kaon beams, and where an extension of the JLab to 22GeV might be beneficial.

In this talk we will discuss the benefits of JLab upgrade and the use of high energy kaon beams for the  $\Omega$ -baryon spectrum explorations.

The other topic which will be addressed is a strange-hidden-charm tetraquarks and pentaquarks production with kaon beams. Many of  $Z_{cs}$  ( $Z_{cs} \rightarrow J/\Psi K$ ) and  $P_s$  ( $P_s \rightarrow J/\Psi \Lambda$ ) states are considered to be of a molecular or dynamically-generated nature. For such states a strong dependence on production mechanism is expected. To address such questions in a non-strange sector a dedicated pion beam programme is considered at J-PARC, however similar states with strangeness would require the use of a strange beam, with the neutral kaon at KLF to be an interesting option realisable at 22GeV JLab facility.

**Primary author:** BASHKANOV, Mikhail (University of York)

**Presenter:** BASHKANOV, Mikhail (University of York)

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