

Hall D KLF E12-19-001  
Intermediate Experiment Readiness Review  
Jefferson Lab August 29-30, 2024

This intermediate K-Long Facility ERR aims to demonstrate the feasibility of the key experiment's objectives using a proton target in real experimental conditions.

Charge

1. Data taking
  - What is the bunch space required to run the E12-19-001 experiment?
  - What is the trigger configuration?
  - What is the expected data volume?
2. Simulations
  - What are the event generators used? I.e. do they adequately generate the events of interest and the background?
  - Is the experimental setup fully simulated?
    - K\_L beam momentum and profile
    - Beam neutrons and photons background
    - Target, spectrometer and trigger
3. Reconstruction of both the main spectrometer and flux monitor
  - How are the detectors calibrated?
    - Energy of the calorimeters
    - Timing calibration
  - How are the detectors aligned?
  - How is the PID performed?
  - Is the reconstruction software adapted to the KLF configuration, considering the different target size and the timing structure of the beam with respect to GlueX?
4. Data analysis
  - What is the status of the analysis chain?

The above questions has to be answered for each of the following reactions:

- a) S=-1 Hyperon Spectroscopy:  $K_L p \rightarrow Y^{*+} \rightarrow \pi^+ \Lambda$  or/and  $n \Sigma$
- b) S=-2 Hyperon Spectroscopy:  $K_L p \rightarrow K^+ \Xi^{0*}$
- c)  $K\pi$  Spectroscopy from threshold up to 2 GeV
- d) Pentaquark  $K_L p \rightarrow P \rightarrow K^+ n$

5. Are the manpower and skill set assigned to the calibration and analysis tasks adequate? Please provide a detailed and realistic evaluation of the available FTE with names if possible.