Proposal for the $K^- + p \rightarrow K^- \pi^+ \pi^- p$ at 1.5 GeV/c Experiment

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Purpose:

The aim of this experiment is to analyze the 4-body final state $K^- \pi^+ \pi^- p$ reactions and to investigate the following:

1. $K^\ast (725)$. The energy of 1.5 GeV/c incident $K^-$ is just below threshold for production of the $K^\ast (880)$. This gives rise to the speculation that the $K^\ast (725)$ can be produced with little or no interference from the $K^\ast (880)$. A search for this resonance will be one of the main objectives of the experiment.

2. It will be interesting to see if one finds the double resonance:

   $$K^- + p \rightarrow K^\ast (725) + N^*_{3/2}$$

   analogous to the $K^+ + p$ experiments which see the $K^\ast (880) + N^*_{3/2}$ final state.

3. One might also be able to test the peripheral model on the diagram:

4. Other resonances such as the $\rho^* (1520)$ and the $N^*_{3/2} (1238)$ will also be possible to look for, in addition to the $p$ at 750 MeV.

Requirements:

The situation with regard to the 4-prongs is the following: All the 4-prongs in the 1.5 GeV/c film have already been scanned twice and are all listed on a library tape. There are of the order of 400 (4-prongs) candidates.

The estimated IEPS time required, assuming a maximum of 30 minutes per event, is 200 hours; or at a 6 hr per day schedule the total analysis would require about 1 1/2 to 2 months to complete. This includes about 6 hours of 7090 machine time.

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