Experimental studies of the $\Lambda(1405)$

physics654 – Seminar on exotic multi-quark states

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Motivation

What is special about the $\Lambda(1405)$?

- its mass does not fit well into constituent quark models which do predict baryon masses well for other baryons
- invariant mass distribution (line shape) differs significantly from usual Breit-Wigner shapes
- candidate for an exotic multiquark state (bound system of $\overline{K}N$) since its mass lies just below threshold

There are (very) many different theoretical approaches to explain this behavior
$\rightarrow$ There is need for more experimental data!

some plots/pictures?

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Continuous Electron Beam Accelerator Facility (CEBAF)

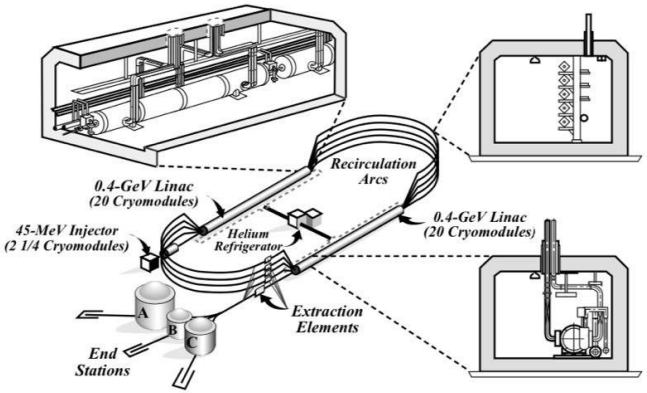

Figure 1: CEBAF layout at Jefferson Lab, [Mecking et al. 2003]

CEBAF Large Acceptance Spectrometer (CLAS)

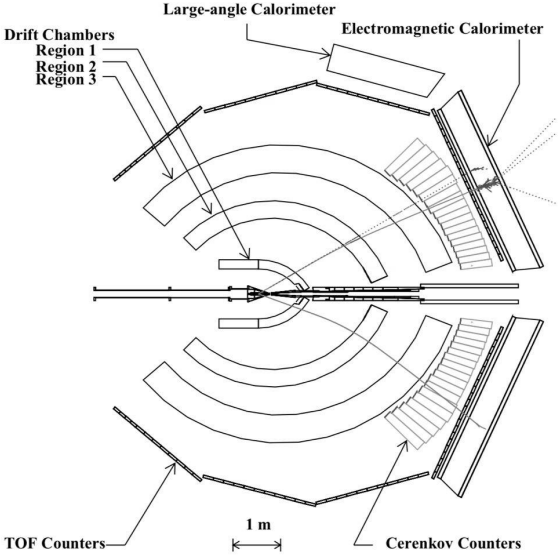

Figure 2: CLAS layout at Jefferson Lab, [Mecking et al. 2003]

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