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A Low Energy Recoil Tracker hyperbolic drift chamber

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A Low Energy Recoil Tracker (ALERT) experiment will occur in Hall B at Jefferson Laboratory, Virginia, USA. It will study the partonic structure of bound nucleons in He-4. The ALERT detector must track and identify low energy nucleons and light nuclei of momenta ranging from 70 MeV/c to 250 MeV/c at a rate up to 60 MHz. It will be used in tandem with the already installed CLAS12 spectrometer in Hall B to detect the scattered electrons.

ALERT is composed of a tracker and a time of flight detector (TOF). The tracker is designed to minimize the amount of material before the particles reach the TOF. This talk will present the ALERT Hyperbolic Drift Chamber developed for the tracker suitable for the high counting rate, high acceptance, and resolution needs of the experiment. After showing the wire support evolution, the mechanical challenges and mounting procedure of the wires that are 2 mm apart will be detailed.

I will then present the performance of a prototype obtained during beam tests performed at a local facility (ALTO) in Orsay, France.

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