Title of Article

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Abstract

As the US Electron Ion Collider (EIC) project enters its conceptual design stage, and future particle accelerators are being discussed worldwide, next generation silicon tracking detectors are being studied for these planned new facilities. This workshop will review tracking and vertexing requirements for the anticipated scientific program at the EIC, the state of the art in silicon tracking detector technologies, their performance in currently operating nuclear and particle physics collider experiments, and proposed applications at the EIC. In addition, there will be discussion of readout, mechanics, and ancillary systems.

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1. Section 1 Name

2. The JLAB Facility at 12 GeV

The CLAS12 detector was designed to study electro-induced nuclear and hadronic reactions by providing efficient detection of charged and neutral particles over a large fraction of the full solid angle. A collaboration of over 40 institutions has participated in the design, fabrication, assembly, and final commissioning of CLAS12 in Hall B at the Thomas Jefferson National Accelerator Facility. The CLAS12 detector is based on a combination of of a six coil toroidal magnet and a high field solenoid magnet. The combined magnetic field provides a large azimuthal coverage in both azimuthal and polar angles. Trajectory reconstruction using drift chambers at forward angles results in a momentum resolution of $\sigma_p/p \approx 0.005$. At large polar angles vertex resolution is $\approx 200 - 300\mu$m with momentum resolution of a few % . Cherenkov counters, time-of-flight systems and calorimeters provide good particle identification for electrons, charged pions, kaons and protons. Fast triggering and high data acquisition rates allow operation in luminosities of $10^{35}\text{cm}^{-2}\text{s}^{-1}$ for extended periods of time. These capabilities are being used in a broad scientific program to study the structure and interactions of baryons, meson and nuclei using polarized and unpolarized targets. This paper provides a general description of the design, construction and performance of CLAS12 and how it expands upon the capabilities provided by the JLab 12 GeV energy upgrade.

3. Section 2 Name

Acknowledgments

Thanks go here.

References

[1] V.D. Burkert *et al.*, *"The CLAS12 Spectrometer at Jefferson Laboratory"*, to be published in Nucl. Inst. and Meth. A, (2020). (see this issue)

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