Jefferson Lab Eta Factory experiment

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(On behalf of GlueX collaboration)

The Jefferson Eta Factory (JEF) experiment will measure various η/η' decays, emphasizing on rare neutral decay modes. Key physics motivations include searching for sub-GeV hidden bosons, C - violating, P - conserving new physics, precision tests of low-energy QCD, and improving the precision of the light quark mass ratio. The main challenge for the rare neutral decay measurement is to suppress the background for a better signal to noise ratio. For that we required to have a high-resolution, high granularity $PbWO_4$ crystal calorimeter (ECAL) to replace the inner part of the previous GlueX forward calorimeter (with lead glass). ECAL offers higher resolutions in energy and position and less overlap showers in the calorimeter. The newly developed ECAL comprises a 40×40 array of PbWO4 scintillating crystal modules. The upgraded calorimeter with an ECAL insert has already been installed in Hall D and final installation of electronics and cables is in progress. The first physics run is scheduled for January 2025. An overview of the JEF experiment will be presented.

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