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The JLab Eta Factory (JEF) experiment

The new experiment, JLab Eta Factory (JEF), in the experimental Hall D at Jefferson Lab will extend the physics potential of the GlueX detector beyond the main spectroscopy program and perform precision measurements of various $\eta^{(\prime)}$ decays with emphasis on rare neutral modes. The physics program of the experiment spans from precision tests of low-energy QCD to search of gauge bosons in the mass range below 1 GeV coupling the SM sector to the dark sector. Photoproduction of highly boosted $\eta^{(\prime)}$ mesons using a tagged photon beam, good detection of recoil proton and multi-photon final states will allow to suppress background and collect high-statistics data sample of η mesons. All these provide many advantages over other $\eta^{(\prime)}$ experiments. The JEF experiment requires to upgrade the inner part of the forward lead glass calorimeter of the GlueX detector with high-granularity, high-resolution lead tungstate PbWO₄ scintillating crystals. The calorimeter insert is currently under construction at Jefferson Lab. The detector will be ready to take data in 2024. An overview of the JEF project will be presented.

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