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Status of the JLab Eta Factory (JEF) experiment[1] SIMON TAYLOR, Jefferson Lab, GLUEX COLLABORATION — The JLab Eta Factory (JEF) experiment is designed to study various decays of the η meson using the GlueX detector in Hall D at Jefferson Lab. The experimental program includes measuring the Dalitz distribution from $\eta \to \pi^+\pi^-\pi^0$ to determine the up/down quark mass difference, looking for evidence for new C-violating/P-conserving physics, providing input to higher-order chiral perturbation theory calculations, and searching for evidence of dark matter. The latter two items rely on measuring the rare $\eta \to \pi^0\gamma\gamma$ decay mode that will require an upgrade to the existing GlueX equipment, which is a fixed target apparatus based on a 2-Tesla solenoid magnet. Charged tracks are reconstructed using drift chambers within the magnet and neutral particles are detected in the forward direction in the Forward Calorimeter (FCAL), an array of lead glass blocks. The JEF program calls for replacing the $\sim$80$\times$80 cm^2 region of the FCAL around the beam line with an array of 2$\times$2$\times$20 cm^3 lead tungstate crystals. The status of this upgrade will be presented.

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