Status of the PrimEx‑*eta* radiative decay width experiment in Hall D at Jefferson Lab\*

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The PrimEx‑*eta* experiment (E12-10-011) at Jefferson Lab performed the first run of a new experiment in Hall D to measure the η radiative decay width with high precision using the GlueX experimental setup. In this experiment the $η\rightarrow γγ$ decay width will be extracted from the photoproduction of $η$‑mesons at extreme forward angles using the so-called Primakoff effect. The two-photon decay of the $η$‑meson is predominantly due to Chiral anomaly in QCD. The projected 3.2% accuracy of the $η\rightarrow γγ$ decay width measurement will significantly impact the $η$-sector of the Particle Data Group’s (PDG) compilation, sizably improving the average value on $Γ(η\rightarrow γγ)$. That, in turn, will improve determination of the rest of the $η$ partial decay widths. It will also significantly improve the $η-η'$ mixing angle. The first run of this experiment was in spring of 2019 to test the capability of the experimental setup. A rich and good statistics initial experimental data set was collected during this run. We are currently analyzing the data to check the experimental method and to prepare for the second full statistics run. The first preliminary physics distributions will be presented and discussed in this talk.

\*My work is supported by NSF Grant NSF PHY-1812421