

Abstract Submitted  
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**The  $\pi^0$  Lifetime: Experimental Probe of the QCD Axial Anomaly**  
DUSTIN MCNULTY<sup>1</sup>, MIT/Jefferson Lab — The  $\pi^0 \rightarrow \gamma\gamma$  decay rate is a fundamental prediction of QCD which gives insight into one of its most profound symmetry issues—namely, the Axial or Chiral Anomaly. It is this anomalous symmetry-breaking mechanism by which the  $\pi^0 \rightarrow \gamma\gamma$  decay channel primarily proceeds, and thus a measure of its rate or partial width,  $\Gamma_{\gamma\gamma}$ , represents a direct probe of the anomaly plus chiral corrections. The PrimEx Collaboration at Jefferson Lab has extracted  $\Gamma_{\gamma\gamma}$  from precision measurements of  $\pi^0$  photo-production cross sections using their Primakoff components. Measurements were made using 5% X<sub>o</sub> nuclear targets of <sup>12</sup>C and <sup>208</sup>Pb with incident photons between 4.9 and 5.5 GeV tagged by the Hall B tagger facility. The  $\pi^0$  decay photons were detected by a specially constructed high resolution hybrid calorimeter (HYCAL). In this presentation, recent preliminary results from the PrimEx measurement will be given with emphasis on the cross section analysis and lifetime extraction.

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