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## Measurement of the neutral pion transition form factor at low $Q^2$ at Jefferson Lab

The neutral pion transition form factor (TFF) plays an important role in tests of low energy QCD, and in the determination of the hadronic-light-by-light (HLbL) scattering contribution to the muon anomalous magnetic moment, ( $g-2$ ). Several measurements of this form factor exist in the large space-like  $Q^2$  region, but the low  $Q^2$  space-like region remains largely unexplored. This talk will present the details and impact of the proposed precision measurement of the TFF to be carried out in Hall B of Jefferson Lab. This experiment will use a 10.5 GeV electron beam, silicon target, and a low background beamline in Hall B to measure the Primakoff cross-section for neutral pion electro-production. These data will be used to extract the pion TFF in the  $Q^2$  range of 0.001-0.1 GeV<sup>2</sup>, and constrain calculations for the HLbL contribution to a muon ( $g-2$ ) at low  $Q^2$ . The author acknowledges support from D.O.E. grant DE-FG02-88ER40415

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