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A New Metric For Triple-Slit Tests of Born's Rule[1] RYAN NESSELRODT, ETIENNE GAGNON, AMY LYTLE , JUSTIN MORENO, Franklin Marshall College — Borns rule provides the critical link between theory and experiment in quantum mechanics, the physics of the smallest scales. Experiments to explicitly test this rule began only recently [Sinha et al., Science 329, 418 (2010)]. Born's rule states that quantum paths interfere only in pairs. This means that the diffraction pattern produced by photons from a coherent source of light incident on 3 open slits is a combination of single slit diffraction and double slit interference. According to Born's rule, there is no higher order interference term. These 3-slit experiments can calculate the Sorkin parameter that characterizes the degree of agreement between Born's rule and their results. Our previous work [Gagnon et al., PRA 90, 013832 (2014)] demonstrates that the normalization scheme used to calculate the Sorkin parameter in those 3-slit experiments is very sensitive to experimental conditions, limiting the impact of the results. In this work, we explore new normalization schemes in order to find one that is more independent of the experimental setup.

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