

Towards a Measurement of the $\omega\pi$ Transition Form Factor

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Two sets of experiments have been performed with the WASA detector at COSY. The intention is to compare the quality of the data between the $\text{pd} \rightarrow {}^3\text{He} \omega$ (at 1.45 GeV and 1.5 GeV beam energy) and $\text{pp} \rightarrow \text{pp} \omega$ (at 2.063 GeV beam energy) reactions, in the sense of a feasibility and background study for $\omega \rightarrow \pi^0 e^+ e^-$ decays. The aim of the physics program is to determine the transition form factor of the ω meson which does not agree with standard Vector Meson Dominance. Until recently, there had not been a theoretical explanation for the observed deviation from VMD [1],[2],[3]. Current theoretical efforts go beyond VMD in a systematic way and require additional experimental input [4]. The form factor is experimentally accessible by comparing the dilepton invariant mass spectrum with the point-like QED prediction.

An analysis of the $\omega \rightarrow \pi^0 \gamma$ decay as a reference channel is being performed for $\text{pd} \rightarrow {}^3\text{He} \omega$. We expect that, using optimized event selection and kinematic fitting, the background from direct pion production will be substantially reduced. The number of ω mesons produced are estimated to be $(1.43 \pm 0.240) \times 10^6$. A first analysis for the $\omega \rightarrow \pi^0 e^+ e^-$ decay is being performed to estimate the number of Dalitz decay events and the invariant mass of the dilepton pair is to be obtained bin by bin. The status of the analysis will be presented.

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