ω Meson Production in Proton-Proton Collisions

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The TOF spectrometer is one of the (external) experiments fed by the proton accelerator COSY, which is located at the Forschungszentrum Jülich, Germany. It stands out for its high acceptance of almost 2π in the laboratory frame and its versatility. Results have been obtained for many hadronic channels, starting from the single-pion threshold up to excess energies as high as 1 GeV.

One of the experimental programs is dedicated to the ω meson production [1], where data was taken for five excess energies (up to $\epsilon = 205\ MeV$) during the last years. From these data sets, total as well as a variety of differential observables are accessible. The energy dependence of these cross sections is a crucial input to theory, since it allows to discriminate between different theoretical approaches (e.g. [2][3]). A very interesting aspect is the comparison of the ω data to results obtained for the reaction $pp \to pp\Phi$ [4], since it allows to check if the reaction dynamics of both vector mesons are similar.

One data set was produced with a polarized beam. The amount of polarization can be determined by the TOF detector with high precision, as will be demonstrated. Polarization observables for $pp \to pp\omega$, which are completely new to the world data set, will be presented and discussed.

[1] The COSY-TOF collaboration, S. Abd El-Samad et al., Phys. Lett. B 522 (2001) 16.
[2] K. Tsushima, K. Nakayama, Phys. Rev. C 68 (2003) 034612.
[3] A. Faessler et al., Phys. Rev. C 70, (2004) 035211.
[4] The DISTO collaboration, F. Balestra et al., Phys. Rev. C 63 (2001) 024004.

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