

# Hadronic decays of the $\omega$ meson measured with WASA-at-COSY

Saturday, 31 May 2014 15:00 (2:00)

## Collaboration

WASA-at-COSY

## Abstract content

Decay studies of the  $\omega$ , a light vector meson, covers a span of interesting physics including  $3\pi$  decay dynamics, the  $\rho - \omega$  mixing and the  $\omega - \pi^0$  transition form factor. The ongoing study presented by this poster covers the first two mentioned topics through measurements of the  $\omega \rightarrow \pi^+\pi^-\pi^0$  and  $\omega \rightarrow \pi^+\pi^-$  channels where the  $\omega$  was produced in the  $p + d \rightarrow {}^3\text{He} + \omega$  reaction and measured with the experimental setup of WASA-at-COSY. A high statistics study of the  $\omega \rightarrow \pi^+\pi^-\pi^0$  dynamics can provide quantitative experimental verification of the predicted onset of the  $\rho$  in the decay process as well as the impact of  $\pi - \pi$  interactions. This study has the goal of providing experimental values of a parametrisation of the Dalitz plot for a comparison with current theoretical predictions, [1,2]. The isospin breaking  $\omega \rightarrow \pi^+\pi^-$  decay can give insight into the behaviour of the  $\rho - \omega$  mixing. This channel has already been widely studied in  $e^+e^-$  collisions where the interference has been conclusively shown as destructive [3]. Only a few measurements with limited statistics have been performed for hadronic production of the  $\omega$  meson with hints of a possible constructive interference [4]. The aim of this study is to investigate the structure of the  $\omega \rightarrow \pi^+\pi^-$  signal in proton on deuteron collisions.

[1] C.Terschlüsen, B.Strandberg, S.Leupold and F.Eichstädt, arXiv:1305.1181 [hep-ph] [2] F.Niecknig, B.Kubis and S.P.Schneider, Eur.Phys. J. C72 (2012) 2014 [3] R.R.Akhmetshin et al., Phys. Lett. B527 (2002) 161 [4] B.N.Ratcliff et al., Phys. Lett. B38 (1972) 345

**Primary author(s) :** HEIJKENSKJÖLD, Lena (Uppsala University)

**Presenter(s) :** HEIJKENSKJÖLD, Lena (Uppsala University)

**Session Classification :** Poster Session