

## Hadrons and Broken Symmetries with WASA-at-COSY

S. Schadmand *for the WASA-at-COSY Collaboration\**

*Institut für Kernphysik and Jülich Center for Hadron Physics, Forschungszentrum Jülich, Germany*

The WASA detector facility is an internal experiment at the COoler SYnchrotron COSY in Jülich, Germany [1]. The COSY accelerator provides proton and deuteron beams with momenta up to 3.7 GeV/c giving access to hadron physics into the strange quark sector. The physics program with the WASA detector involves hadron dynamics and hadron structure. Key experiments address fundamental symmetries and symmetry violations via the study of rare and not-so-rare meson decays.

From the very first production run, results on the Dalitz plot slope parameter in the isospin violating  $\eta \rightarrow 3\pi^0$  decay have been obtained [2]. The  $3\pi^0$  final state is also used to study meson production mechanisms [3]. Investigations of other decay modes of the  $\eta$  meson address C,P, and T symmetries, and combinations. Higher orders in chiral perturbation theory are probed with the decay  $\eta \rightarrow \pi^0\gamma\gamma$  [4]. The status and plans for studying hadron structure with Dalitz decays of mesons is presented [5, 6].

### References

- [1] [www.fz-juelich.de/ikp/wasa](http://www.fz-juelich.de/ikp/wasa) and [nucl-ex/0411038](http://nucl-ex/0411038)
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- [3] Neha Kiritkumar Shah (IIT Bombay), Contributory paper at this conference.
- [4] Kavita Chandwani (IIT Bombay), Contributory paper at this conference.
- [5] Himani Bhatt (IIT Bombay), Contributory paper at this conference.
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\*Electronic address: [s.schadmand@fz-juelich.de](mailto:s.schadmand@fz-juelich.de)