

Search for the eta-mesic ^4He with WASA-at-COSY

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The eta-mesic nuclei in which the eta meson is bound with nucleus via strong interaction was postulated about 25 years ago, however till now there is no direct experimental confirmation of its existence.

We search for an evidence of eta-mesic He with the WASA detector. An exclusive measurement of the excitation functions for the $dd \rightarrow ^3\text{He} p \pi^-$ and for the $dd \rightarrow ^3\text{He} n \pi^0 \rightarrow ^3\text{He} n \pi^+ \pi^-$ reactions was performed at the Cooler Synchrotron COSY-Juelich with the WASA-at-COSY detection system. The outgoing N-pi pairs originate from the conversion of the eta meson on a nucleon inside the He nucleus. The data were collected in two dedicated experiments in 2008 and in 2010.

The experimental method and the current status of the research will be presented.

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