Search for He-eta bound states with the WASA-at-COSY facility.

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The existence of η-mesic nuclei in which the η meson is bound in a nucleus by means of the strong interaction was postulated already in 1986 [1] but it has not been yet confirmed experimentally. The discovery of this new kind of an exotic nuclear matter would be very important as it might allow for a better understanding of the η meson structure and its interaction with nucleons [2,3]. The search for η-mesic helium (^{4}He-η) is carried out with high statistics and high acceptance with the WASA detector, installed at the cooler synchrotron COSY of the Research Center Jülich [4].
The search is conducted via the measurement of the excitation function for selected decay channels of the ^{4}He-η system. In the experiment, performed in November 2010, two reactions $dd \rightarrow (^4\text{He-}\eta)_{bs} \rightarrow {}^3\text{He}p\pi^-$ and $dd \rightarrow (^4\text{He-}\eta)_{bs} \rightarrow {}^3\text{He}n\pi^0$ were measured with a beam momentum ramped from 2.127GeV/c to 2.422GeV/c. The poster will include description of the experimental method and status of the analysis.

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