New results on the pd $\rightarrow$ ^{3}He η production from threshold up to Q=40 MeV

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Close to threshold data on the pd $\rightarrow$ ^{3}He η reaction are of great interest to study the strong attractive η-nucleus interaction at low energies, which might be a signal for the existence of quasi-bound η-nucleus states. We present new results on the η-production in proton-deuteron collisions performed using the COSY-11 facility at COSY-Juelich (FZJ). With five new data points measured at excess energies between Q=5.1 and Q=40.6 MeV, we are able to close the gap between measurements carried out at SPES-II (SATURNE) below an excess energy of 7 MeV, showing an almost isotropic angular distribution, and results from WASA/PROMICE (CELSIUS) and GEM (COSY) above excess energies of 20 MeV, yielding non-isotropic angular distributions.

Besides presentation of total and differential cross sections, we also discuss over the range of the five studied beam momenta the change in the angular distributions from an almost isotropic (S-wave) emission at low Q-values to contributions from higher partial waves leading to a non-isotropic angular distribution at the higher Q-values. Finally a comparison of the data with predictions of theoretical models to describe the underlying reaction mechanism will be given.

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