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Identification of 10He low-lying states in the 3H(8He,p)10He reaction

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The low-lying spectrum of 10He nucleus was studied in the 3H(8He,p)10He transfer reaction. The 0+ ground state was observed at about 2.1 ± 0.2 MeV ($\Gamma \sim 2$ MeV) above the three-body 8He+n+n breakup threshold. Angular correlations observed for 10He decay products show prominent interference patterns allowing us to make conclusions about the structure of low-energy excited states. We interpret the energy spectrum of 10He obtained in the experiment as a result of a coherent superposition of the
broad 1- state with a maximum located in the energy range 4-6 MeV and the 2+
state at the energy > 6 MeV on top of the 0+ state "tail". This anomalous level ordering indicates that the shell inversion phenomenon observed
in 12Be extends also to 10He system as the last known member of N=8 isotone.

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