

Correlated quantum states in LENR: first exciting results from an experimental test

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First experimental test of the Correlated-Coherent quantum States (CCS) model [1-2] is described in this paper, showing its potentialities in the explanation of anomalous effects in Nuclear Physics and Astrophysics, such as excess energy production in LENR and the big cosmological enigma of primordial lithium [3].

The occurrence of nuclear reactions at very low energy is a clear indication of a strong enhancement of Coulomb barrier transmissivity, which has been observed in several other accelerator experiments [4-5]. These experiments are, however, downwards limited in energy ($E_{\min} \geq 5$ keV) due to the strong electrostatic repulsion. In the present experiment ([6-7] for more details) the ${}^7\text{Li}(p,\alpha){}^4\text{He}$ reaction has been investigated at a c.m. energy around 450 eV, where the expected “standard” cross section is of the order of 10^{-50} barn! The detected α are unambiguously identified as coming from the above reaction and cannot be ascribed to background. In the same experiment no evidence of the alternative reaction ${}^6\text{Li}(p,\alpha){}^3\text{He}$ has been found, according to the expectation of CCS theory [6-8].

Some technical issues, which are related to this difficult experiment are discussed and possible suggestions for improvement and planning of the next activity on this topic are also presented.

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