

Search for periodical variations of Fe-55 nucleus weak decay parameters

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Possible temporal variations of nucleus decay parameters studied extensively in the last years, their observation can be the signal of unknown physical effects. Earlier, several experiments reported the annual and daily decay rate oscillations in alpha and beta-decays of some nuclides of the order .05 %. Our experiment studies the decay rate variations in inverse beta-decay (e-capture) of Fe-55 isotope. In this process K-shell electron absorbed by nuclei and electron neutrino emitted; it accompanied by X-ray with energy 5,9 or 6,4 KeV which in our set-up detected by cooled Si-Pin detectors. Together with observed Fe-55 decay exponent with life-time 1004 days, daily oscillation component value is found at the level (.21 +/- .04)%. Another period 29.5 +/- 1.5 days corresponding to moon month is found with amplitude (.32 +/- .4)% is also observed. Analogous Fe-55 decay measurements by Si-Pin detectors in orbital flight conditions are planned at International Space Station as part of DODO project.

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