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CFA LECTURES

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The experimental searches of hadronic axions

- Abstract -

The experimental searches for solar hadronic axions are typically based on processes of emission of mono-energetic axions in an M1 nuclear transition inside the solar core, and the consequent resonant absorption by the same nuclei in a laboratory detector. For last two decades, this scheme of experiment was applied to stable nuclides (Fe-57, Kr-83, ...) with low-lying levels which can be thermally excited in the solar core, as well as to nuclides with levels populated in the pp-chain (Li-7). The exposure (defined as a product of number of target nuclei by the detection efficiency by the live time) in all previous experiments was relatively low. I will discuss the performed attempts of resonant detection of solar hadronic axions and the new experiment with a big Kr-83 proportional counter which is operated in the Baksan Neutrino Observatory. The exposure in this experiment will be much more than in all previous searches of such kind, and the expected sensitivity to the mass of KSVZ-axions is ~ 100 eV.

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