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Experimental searches for solar axions.

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Intensive experimental searches for axions and axion-like particles are currently supported by two main reasons: firstly, axions solve the CP problem of strong interactions and, secondly, axions are well-motivated candidates for the role of dark matter particles. If axions exist, the Sun should be a powerful source of such particles. The expected energy spectrum of solar axions, like the spectrum of solar neutrinos, contains both continuous spectra and monochromatic lines. Moreover, the fluxes of solar axions should be directly proportional to the fluxes of neutrinos; only the proportionality coefficients remain unknown, which are determined by the effective coupling constants of the axion with photons, electrons, and nucleons. The report discusses some past, present and future experiments aimed at detecting solar axions and axion-like particles. This work was supported by the Russian Foundation for Basic Research (project nos. 16-29-13014, 17-02-00305 and 19-02-00097).

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