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On the possibility of mixed axion/neutralino dark matter in specific SUSY DFSZ axion models

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We introduce four supersymmetric (SUSY) axion models in which the strong CP problem and the μ problem are solved with the help of the Peccei-Quinn mechanism and the Kim-Nilles mechanism, respectively. The axion physics enriches the SUSY model by introducing axion as a dark matter candidate and, therefore, the lightest supersymmetric particle (LSP) could just be a part of the total dark matter. For this reason, axion relieves the tensions between SUSY models and numerous experimental measurements, such as the dark matter direct detection experiments and the precise measurements of anomalous magnetic moment of the muon a_μ. In the present paper, we consider the constraints from the latest a_μ data and the LZ-2022 bound on the relic density of higgsino-like LSP, and discuss the possibility that axion is the rest of dark matter.

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