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# Abelian-Higgs vortices in the oscillating axion background

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Axion is one of the well-motivated candidates for dark matter and there have been many attempts for axion dark matter search. In this talk, we show novel aspects of the axion dark matter, which significantly modify the physics of vortex in the Abelian-Higgs model. Due to the axion-photon conversion, electromagnetic fields are induced in the magnetic core of the vortex. In numerical simulations, we find that the induced electromagnetic field is confined and resonantly enhanced in the vortex, which implies that the vortex acts as a cylindrical cavity. We also focus on the interaction of two vortices in the oscillating axion background, resulting in attractive or repulsive forces, even in the case with the BPS limit. These new features open up a new possibility for the axion dark matter search using superconducting devices.

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