

Peer Review

Review of: "Populating Dark Sectors with Relativistic Bubble Walls"

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The paper discusses the production of dark matter during FOPT. It considers two possibilities for DM production: freeze-out and freeze-in, with the main focus on freeze-out production. Further, it considers DM production first via the renormalizable operator and then via a non-renormalizable operator. The paper also discusses the generation of gravitational waves during FOPT.

The manuscript is poorly written, and the DM analysis in the setup is also not very concrete. Therefore, I cannot accept this paper for publication.

Below are some of my comments that can help the author to improve the manuscript further:

1. The author needs to work a lot on the manuscript, especially the writing part.
2. In section 3, the author should first discuss what the issue is with a minimal scalar singlet DM in detail and then motivate their study.
3. It is not very clear why the dark Higgs does not mix with the SM Higgs. If the mixing is allowed, the DM can annihilate the SM particle, which can significantly affect the allowed region of parameter space.
4. The mass of the dark Higgs is also not mentioned clearly.

Declarations

Potential competing interests: No potential competing interests to declare.