Contribution ID: **10** Contribution code: **S03-GC-104** Type: **Oral presentation**

Spontaneously broken scale-invariant nonlinear electrodynamics and thin shell wormholes

Tuesday, 30 August 2022 17:30 (15 minutes)

Maxwell's action in vacua is scale-invariant. This causes singularity in the fields and infinite self-energy. By breaking this symmetry one may remove the singularity as well as make the self-energy finite. In the context of the spontaneously broken scale-invariant nonlinear electrodynamic with a magnetic dominance, we introduce black a hole solution.

We study the physical properties of the solution and particularly investigate its thermal stability.

Furthermore, we construct a thin-shell wormhole (TSW) in this bulk spacetime. We show that the surface tension of the TSW constructed TSW becomes zero with a fine-tuned parameter in a static configuration. This in turn implies the exotic matter present at the throat is a cloud of exotic dust. The dynamics of the TSW powered by the exotic dust are also analyzed in detail. We present a mechanical stability analysis to show that the TSW is stable against a radial linear perturbation.

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Session Classification: S03 Gravitation and Cosmology

Track Classification: Scientific Sections: S03 Gravitation and Cosmology