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Solitinic gravastars in a U(1) gauge-Higgs model

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It is known that black holes have unsolved problems such as the singularity problem and the information loss problem. To solve these problems, as one of the black hole mimicker, gravastar is proposed. Gravastar is filled by cosmological constant, and therefore metric is de-Sitter inside the star. In usual, gravastar solutions are constructed by using Israel's junction condition. By the way, in classical field theories with global U(1) symmetry, it is known that there are classical solutions called nontopological solitons which the fields are spatially localized. Recently, we have found that there exists a nontopological soliton (NTS) in the coupled system of a complex scalar field, a U(1) gauge field, and a complex Higgs field. The NTSs are filled with the cosmological constant. In this presentation, we will show that a gravastar solution can be realized by coupling a gravitational field to this NTS solution and discuss its properties.

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