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Can the Black Hole Singularity be Avoided by a Dynamical Vacuum State?

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We investigate the gravitational collapse of a spherically symmetric massive core of a star in which the fluid component is interacting with a growing vacuum energy density. Two different analytical examples are given. In the first one, we show that for all physically reasonable values of the free parameter, the vacuum energy density increases the collapsing time, but it cannot prevent the formation of the horizon and the singular point. However, it is argued that the final singular state can be generically avoided when the dynamical vacuum increases rapidly enough. In this case, the star core evolves to a final nonsingular de-Sitter configuration.