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Spherical and Non-spherical collapse of a finite two-layer body

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We study the simplest possible analytical model for spherical collapse that involves density variations, that of a homogeneous core surrounded by a different homogeneous layer, where both are joined using the Darmois matching conditions. The aim is to obtain an analytical expression for whether or not a naked singularity forms, in terms of both mass densities. Although there have been several investigations during the last decade about inhomogeneous collapse models (e.g. Joshi, Bicak), the reason that here we pursue the simplest possible Spherical Model is so that we can then proceed to apply it to Non-spherical collapse by using the Price-Cunningham-Moncrief (1980) slow-rotation framework. This should provide a first indication of how inhomogeneity may lead to the formation of something different to the Kerr Black Hole during a rotating collapse.

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