

Abstract Submitted
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Gravitational Collapse and Shocks in Two-Phase Celestial Bodies MICHAEL GRINFELD, The U.S. Army Research Laboratory, PAVEL GRINFELD, Drexel University, Department of Mathematics — The phenomenon of gravitational collapse (GC) is well-known in theoretical astro- and planetary physics. It occurs when the incompressibility of substances is unable to withstand the pressure due to gravitational forces in celestial bodies of sufficiently large mass. The GC never occurs in incompressible models – homogeneous or layered. This situation changes dramatically when different incompressible layers appear to be different phases of the same chemical substance and the mass exchange between the phases can occur due to phase transformation. The possibility of destabilization in such system becomes realistic, as it was first discovered in the Ramsey static analysis [1,2]. We will present our generalization of the Ramsey’s results using dynamic approach. [1] W.H. Ramsey, ”On the instability of small planetary cores”, Mon. Not. R. Astron. Soc. 110 (4), 325-338 (1950). [2] H. Jeffreys, ”The Earth: Its Origin, History, and Physical Constitution”. Cambridge University Press (1976).

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