# ON THE VARIATIONAL PRINCIPLE AND EFFECTIVE ACTION FOR A SPHERICAL DUST SHELL IN GENERAL RELATIVITY

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S u m m a r y

The variational principle and the effective action for a thin spherical dust shell in a gravitational field are constructed. The variational principle is consistent with the boundary-value problem of the corresponding Euler–Lagrange equations, and leads to "natural boundary conditions" on the shell. These conditions and the field equations are used for performing the Lagrangian reduction of the system and eliminating the gravitational degrees of freedom. The equations of motion for the shell follow from the obtained reduced action. The modification of the variational procedure leads to two natural variants of the effective action. One of them describes the shell in the reference frame of a stationary interior observer, another in that of the exterior one. The isometric conditions of the exterior and interior faces of the shell lead to the momentum and Hamiltonian constraints.