

Modified gravity over the linearized metric perturbation for two body dynamics

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September 26, 2021

Abstract

In this paper Modified gravity is studied over the weak field linearized metric perturbation in post-Minkowskian theory. This is a different aspect for studying the two body dynamics or binary system. Here despite of usual self force originated from the radiative backscattering of gravitational waves we are considering new paradigm of perturbation that is multiplicative approach. The new perturbed metric is determined over the multiplication of isolated background metric of curved space-time for two different massive sources in post-Newtonian theory. To verify the model and the theoretical result the binary system of Milky Way central super massive black hole to Sun is considered. The computation shows remarkable result without MOND for galactic flat rotation curve and solar rotational speed 249km/sec, obviously very good agreement with recent observed data.

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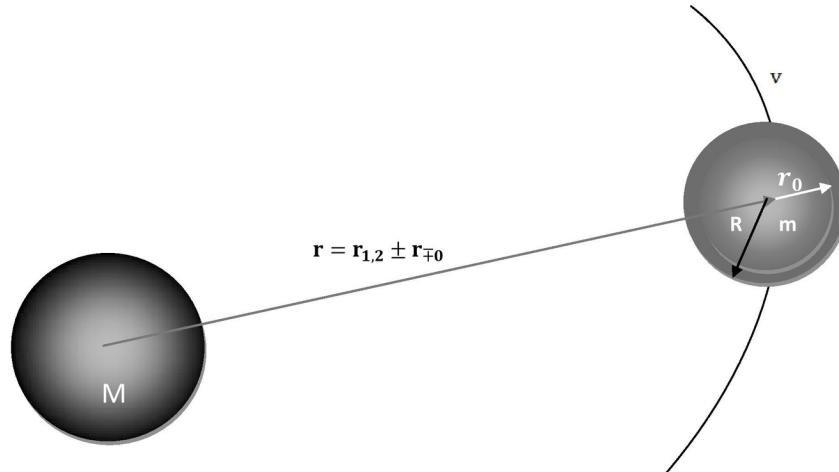
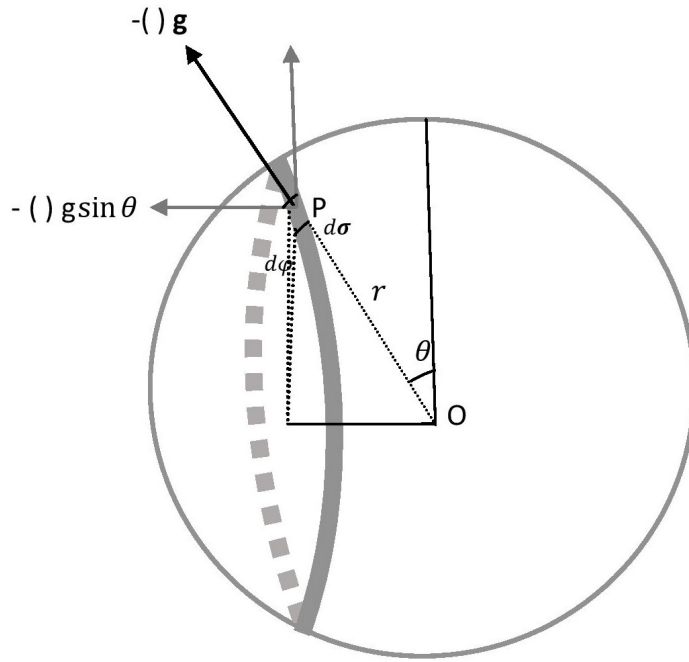


Fig.1

Rotation of star of mass m around SMBH of mass M



To get simplistic realisation of the model one can imagine the below-

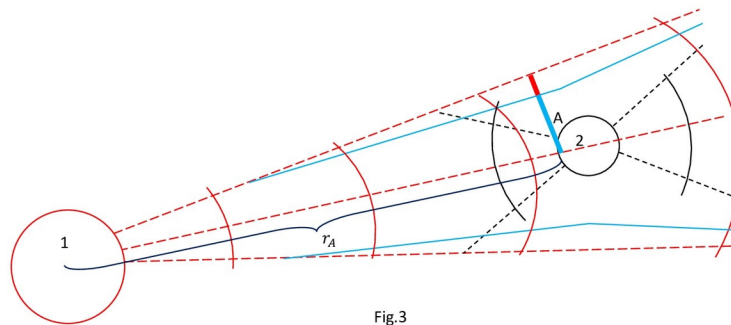


Fig.3

Schematic diagram of 2 dimensional space for two different sources 1 and 2.

The potential/field at r_A is less in absence of source 2, perturbation (**BLUE LINES**) due to presence of source 2 at r_A indicates magnification of local field (contraction of space). As described by the modification of gravity due to self gravity of the 2nd body in a binary system.

The dynamics especially geodesic motion of mass 2 is now governed by the perturbed spacetime!