

Abstract Submitted
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Gravitational Radiation and Spiral Structure of Galaxies¹

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— First we show that the Einstein GR can be uniquely modified using the principle of interaction dynamics (PID) to take into account the effect of dark energy and dark matter phenomena, and to preserve the Einstein's two fundamental principles: the PE and the PGR. The gravitational field particle and radiation are described by the dual field $\{\Phi_\mu\}$, which is a spin-1 massless particle. This field particle can be regarded as the dark matter, and the energy it carries is the dark energy. Then the gravitational radiation leads to the introduction of gravitational temperature, called G-temperature. We derive three crucial parameters dictating the formation of different galactic structures: Ra representing the G-temperature difference, a parameter a representing the average velocity of stars in the galaxy, and a parameter ℓ representing the relative ratio between the inner and outer radii of galactic disk. We show that if Ra is less than a critical threshold R_c or if ℓ is small, then the galaxy is elliptic, and if Ra is large then R_c and ℓ is relatively large, then the galaxy is spiral.

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