

Abstract 87 – Paper ID: 095**Dynamical System Approach of Modified $f(R, G, T)$ Gravity and Its
Cosmological Implications**Elangbam Chingkheinganba Meetei¹, S. Surendra Singh¹¹Department of Mathematics, National Institute of Technology Manipur, Imphal-795004, India*Email: chingelang@gmail.com***Abstract**

We perform a comprehensive phase-space analysis of a generalized modified gravity model characterized by $f(R, G, T) = \alpha R^l + \beta G^m + \gamma T^n$, where α , β , γ and l , m , n denote the model parameters. By introducing suitable dimensionless variables, the modified Friedmann equations are transformed into an autonomous system of ordinary differential equations. The resulting dynamical system admits eight critical points, whose physical properties and stability are studied through linear perturbation analysis. We identify four late-time stable attractors associated with accelerated cosmic expansion. The model predicts a transition redshift of $z_{\text{tr}} = 0.616$, a present-day deceleration parameter of $q_0 = -0.50$, and an effective equation-of-state parameter of $\omega_0 = -0.66$, all consistent with current observational bounds. The evolution of density parameters with respect to the e-folding variable $N = -\ln(1+z)$ further demonstrates that the Universe is presently dominated by an effective dark-energy component. These results indicate that the considered $f(R, G, T)$ gravity framework provides a viable description of late-time cosmological dynamics.

Keywords: Dynamical system, modified $f(R, G, T)$ gravity, density parameters, cosmic evolution