

# Gravitational Waves and Electromagnetic Field in a Higher Order Theory of Gravity

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## ABSTRACT

Theory of gravity and its modifications have attracted scientist over the years owing to its applicability in numerous branches of physics providing solutions to various astrophysical riddles. Among the various modifications, in particular,  $f(R)$  theories of gravity based on various motivations have gained more attention. In the present work we have solved Field equations of an  $f(R)$  theory of gravity based on conformal invariance of gravitational waves for a form of generalized Peres spacetime by considering the simultaneous existence of electromagnetic waves along with gravitational waves. The wave like solution hence obtained is analyzed and important features are highlighted.

**Keywords:** Conformal invariance, Peres space-time, Gravitational wave

