

Dynamical Spacetime Effects on Intense Laser Interactions

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Next-generation laser facilities are expected to reach intensities at which previously unobserved phenomena (such as nonlinear electrodynamics and radiation reaction) can be probed. This is achieved by compressing large amounts of energy into ever-smaller volumes. Although for current and near-future lasers, the energy density is not expected to excite gravitational degrees of freedom, Einstein's equations nonetheless require that spacetime in these regions be curved, and it is important to understand the consequences of this curvature. Moreover, other interactions can be mimicked by (non-gravitational) effective curvature, and this duality provides new insights into their nature. In this talk, we explore some subtle features of dynamical spacetime in intense laser interactions and discuss their possible significance to future experiments.