Outline & Summary

We show how the dynamics depend on the dimensionality and how the higher-order curvature terms affect singularity formation in two models: (I) colliding scalar pulses in planar space-time, and (II) perturbed wormhole in spherical symmetric space-time.

Our numerical code uses dual-null formulation, and we compare the dynamics in 5, 6 and 7-dimensional Gauss-Bonnet gravity.

1. For scalar wave collisions, we observe that curvature evolutions (Kretschmann invariant) are milder in the presence of Gauss-Bonnet term and/or in higher-dimensional space-time.

2. For wormhole dynamics, we observe that the perturbed throat will be easily enhance in the presence of Gauss-Bonnet term. Both suggest that the thresholds for the singularity formations become higher in Gauss-Bonnet gravity, although it is not evitable.

Field Eqs.

Wormhole Evolutions

Colliding Scalar Waves

Results in 4-dim. GR

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