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Non-analyticity of holographic Renyi entropy in Lovelock gravity

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Non-analyticity of holographic Renyi entropy in Lovelock gravity
Abstract: We compute holographic Renyi entropies for spherical
entangling surfaces on the boundary while considering third order Lovelock
gravity with negative cosmological constant in the bulk. Our study shows
that third order Lovelock black holes with hyperbolic event horizon are
unstable, and at low temperatures those with smaller mass are favoured,
giving rise to first order phase transitions in the bulk. We determine
regions in the Lovelock parameter space in arbitrary dimensions, where
bulk phase transitions happen and where boundary causality constraints are
met. We show that each of these points corresponds to a dual boundary
conformal field theory whose Renyi entropy exhibits a kink at a certain
critical index n.

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