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Limiting curvature gravity and problem of singularities

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I shall discuss a recently proposed limiting curvature theory of gravity and its application to the problem of singularities in cosmology and inside black holes. In this theory the growth of the curvature is suppressed by specially chosen inequality constraints included in the gravity action. In this model the Universe has a bounce instead of the initial Big Bang singularity. We also consider a case of a spherically symmetric four dimensional black hole and demonstrate that imposed curvature constraints modify a solution in the black hole interior. Instead of forming the curvature singularity the modified metric describes a space which is exponentially expanding in one direction and oscillating in the other two directions. The spacetime is complete and its polynomial curvature invariants are uniformly bounded.

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