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New Ricci flow invariant curvature conditions and applications

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Abstract

We consider a very simple curvature condition: Given constant c and a dimension n we say that a manifold (M, g) satisfies the condition (c, n) if the scalar curvature is bounded below by c times the norm of the Weyl curvature. We show that in each large even dimensions there is precisely one constant $c = c(n) > 0$ such that this condition is invariant under the Ricci flow.

The condition behaves very similar to scalar curvature under conformal transformations and we indicate how this can be utilized to get a large source of examples. Finally we speculate what kind singularities should develop under the Ricci flow.