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Weighted Ricci curvature with synthetic dimension 1

We study Riemannian and Lorentzian manifolds with density that satisfy weighted Ricci curvature bounds of effective dimension one, a weaker condition than has previously been studied. The main observation is that the weighted Ricci tensor in this case carries an extra structure, as it is the Ricci tensor of a natural torsion free connection. Using this connection we prove sharp generalizations of the basic comparison results for Ricci curvature lower bounds. A general feature of all of our rigidity results is that warped or twisted products, as opposed to direct products are characterized. Some of the material in this talk comes from joint works with Eric Woolgar and Dmytro Yeroshkin.