

The positive mass theorem in dimension 8

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There are two approaches to the celebrated positive mass theorem: * Witten's Dirac operator method, which needs a spin structure * the minimal hypersurface method of Schoen-Yau, which suffers from issues with singularities if the dimension is > 7 . Here, dimension 8 is the borderline case. Singularities do occur, but Smale has shown in some instances that on closed manifolds, generically they can be avoided. We describe joint work with Jakob Dittmer how this method can be extended to prove the positive mass theorem in dimension 8. Note that this shows how one can use the essentially classical approach also in this one more dimension. Other work by Schoen-Yau and Lohkamp -which is still under investigation by experts- covers arbitrary dimensions with fundamentally new methods.