

Stability of the positive mass theorem for axisymmetric manifolds

Edward Brydon^{1,*}

¹*Department of Mathematics, Tübingen University, Germany*

*Email: etbryden@gmail.com

We investigate the stability of the Positive Mass Theorem for three-dimensional axisymmetric manifolds. It is widely known that asymptotically flat manifolds with nonnegative scalar curvature have nonnegative ADM mass, and that the only asymptotically flat manifold with nonnegative scalar curvature and zero ADM mass is Euclidean space. We will show that axisymmetric manifolds with nonnegative scalar curvature and small ADM mass, and which satisfy an additional technical assumption, are close to Euclidean space in a Sobolev sense.