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## Spacetime Penrose Inequality for Cohomogeneity One Initial Data

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The spacetime Penrose inequality (SPI) is a geometric inequality bounding the mass of an asymptotically flat black hole from below in terms of the area of its event horizon. It has been proved in the setting of time symmetric initial data (the Riemannian Penrose inequality). We outline a proof of the SPI for asymptotically flat 2(n+1)-dimensional initial data sets which are invariant under a cohomogeneity one action of SU(n+1). Analogous results are obtained for asymptotically hyperbolic initial data that arise as spatial hypersurfaces in asymptotically Anti de-Sitter spacetimes. The inequality is saturated if and only if the initial data isometrically embed into a Schwarzschild(-AdS) spacetime. The proof relies on the generalized Jang equation approach of High Bray and Marcus Khuri.

## Keyword-1

black holes

## Keyword-2

general relativity

## Keyword-3

mathematical physics

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