

Abstract

Banados-Teitelboim-Zanelli (BTZ) black holes are constructed by orbifolding AdS3 geometry by boost transformations of its $O(2,2)$ isometry group. Here we construct a new class of solutions to AdS3 Einstein gravity, orientifolded BTZ or O-BTZ for short, which in general, besides the usual BTZ orbifolding, involve orbifolding (orientifolding) by a Z_2 part of $O(2,2)$ isometry group. This Z_2 is chosen such that it changes the orientation on AdS3 while keeping the orientation on its 2D conformal boundary. O-BTZ solutions exhaust all un-oriented AdS3 black hole solutions, as BTZ black holes constitute all oriented AdS3 black holes. O-BTZ geometries are supported by a δ -function source at the orientifold fixed locus which is a space-like cylinder located in the middle of the region between the two horizons. O-BTZ, similarly to BTZ black holes, are stationary, axisymmetric asymptotically AdS3 geometries with two asymptotic charges, mass and angular momentum.