

**Barbot, Thierry**

**Causal properties of AdS-isometry groups I: Causal actions and limit sets.** (English)

Zbl 1151.83311

Adv. Theor. Math. Phys. 12, No. 1, 1-66 (2008).

Author's abstract: We study the causality relation in the 3-dimensional anti-de Sitter space AdS and its conformal boundary  $\text{Ein}_2$ . To any closed achronal subset  $\Lambda$  in  $\text{Ein}_2$  we associate the invisible domain  $E(\Lambda)$  from  $\Lambda$  in AdS. We show that if  $\Gamma$  is a torsion-free discrete group of isometries of AdS preserving  $\Lambda$  and is non-elementary (for example, not abelian) then the action of  $\Gamma$  on  $E(\Lambda)$  is free, properly discontinuous and strongly causal. If  $\Lambda$  is a topological circle then the quotient space  $M_\Lambda(\Gamma) = \Gamma \backslash E(\Lambda)$  is a maximal globally hyperbolic AdS-spacetime admitting a Cauchy surface  $S$  such that the induced metric on  $S$  is complete. In a forthcoming paper we study the case where  $\Gamma$  is elementary and use the results of the present paper to define a large family of AdS-spacetimes including all the previously known examples of BTZ multi-black holes.

Reviewer: **Grozio Stanilov (Sofia)**

**MSC:**

- 83C15** Exact solutions to problems in general relativity and gravitational theory
- 83C20** Classes of solutions; algebraically special solutions, metrics with symmetries for problems in general relativity and gravitational theory
- 83F05** Relativistic cosmology

Cited in **1** Review  
Cited in **7** Documents

**Keywords:**

anti de Sitter space; Einstein universe; hyperbolic space; cosmological time; causality

**Full Text:** [DOI](#) [Euclid](#)