

ABSTRACT. For isometric actions on flat Lorentz $(2+1)$ -space whose linear part is a purely hyperbolic subgroup of $O(2, 1)$, Margulis defined a *marked signed Lorentzian length spectrum* invariant closely related to properness and freeness of the action. In this paper we show that, for fixed linear part, this invariant completely determines the conjugacy class of the action. We also extend this result to groups containing parabolics.