**General Relativity and Quantum Cosmology**

# Acoustic geometry for general relativistic barotropic irrotational fluid flow

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"Acoustic spacetimes", in which techniques of differential geometry are used to investigate sound propagation in moving fluids, have attracted considerable attention over the last few decades. Most of the models currently considered in the literature are based on non-relativistic barotropic irrotational fluids, defined in a flat Newtonian background. The extension, first to special relativistic barotropic fluid flow, and then to general relativistic barotropic fluid flow in an arbitrary background, is less straightforward than it might at first appear. In this article we provide a pedagogical and simple derivation of the general relativistic "acoustic spacetime" in an arbitrary (d+1) dimensional curved-space background.

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