

Abstract Submitted
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Solving the Transfer Equation for Arbitrary Flows in Static Spacetimes BIN CHEN, R. KANTOWSKI, E. BARON, University of Oklahoma, SEBASTIAN KNOP, Hamburger Sternwarte — We describe the derivation of the radiative transfer equation for arbitrary stationary relativistic flows in static spacetimes. We show that the standard characteristics method of solution developed by Mihalas and used throughout the radiative transfer community can be significantly simplified in that the characteristics always coincide with geodesics and can always be specified by constants. Thus, the direct integration of the characteristics is not required, since they are (in principle) known for a specified metric. We give details for both flat and static spherically symmetric spacetimes. This work has direct application in 3-dimensional simulations of supernovae, gamma-ray bursts, and AGN, as well as in modeling neutron star atmospheres.

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