

The modern problem of computational radiative transfer

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Abstract

The aim is to formulate the modern problem of computational radiative transfer and explain how it is solved in the **Magritte** code.

1 Problem definition

Consider a multidimensional space with a scalar field $I(\mathbf{x}, \hat{\mathbf{n}})$, depending on both the position \mathbf{x} and the viewing direction $\hat{\mathbf{n}}$ in that space. Consider a

1.1 Method of rays

We choose to solve the problem by directly integrating the transfer equation along each ray. The result of this calculation is the intensity at a certain point in a certain direction.

2 Input data

Since we want to develop a general-purpose code, we need to make sure that it can handle many different types of input. We input can come from the output of a hydrodynamics code For every different type we will consider the best way to handle the

2.1 Model input

2.2 Hydro output as input

2.2.1 AMR grid

The simplest way to handle an AMR grid input is to use the centers of the grid cells as set input grid points G .

2.2.2 SPH data

References