Masterthesis

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1 Introduction

1.1 Fortran

Fortran is a general-purpose, compiled imperative programming language that is especially suited to numeric computation and scientific computing.
What does compiled and imperative mean?
How do you run a program using modules?
gfortran my_mod.f90 gives error.
gfortran -c my_mod.f90 seems to work.
gfortran -c use_mod.f90 -o use_mod seems to work.
./use_mod states that permission is denied.

1.2 3+1 Decomposition

1.3 Gmunu

What differenciates Gmunu from other existing relativistic hydrodynamics code? Most code are based on solving hyperbolic equations whereas Gmunu solves elliptic metric equations. Elliptic equations are more computationally expensive than hyperbolic equations.

1.3.1 Multigrid

Multigrid methods vary the discretizationsteps of numerical solutions of differential equations saving computational power on less relevant grid points and increasing resolution on high gradient regions.