MAGIC

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Coarray Fortran Adaptive Mesh Refinement Code for Numerical Modeling of the Interaction between the Relativistic Wind of the Accretion Disk and a Molecular Cloud

When simulating relativistic gas flows, complex flows are often formed in zones that are much smaller than the entire calculation domain. The processes that take place outside such zones may greatly affect not only the behavior but also the formation of the complex flows. The use of adaptive mesh refinement technique is a universal method of domain discretization in computing such multi-scale flows. In talk will propose original the Patch-Block-Structured Adaptive-Mesh-Refinement (AMR) technique for multi-scale modeling of special relativistic hydrodynamics flows. To use this technique, the numerical method was redesigned in a special way for using Coarray Fortran technology. Was showed that we have an almost linear 45-fold speedup with 48 Coarray Fortran images on 48 cores. This parallel code on base original AMR technique is used to simulate the interaction of a relativistic wind with clouds in the interstellar medium.

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