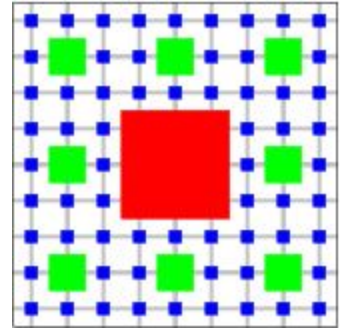





CarpetX - using AMReX for mesh refinement



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About AMReX

- block-structured mesh refinement library <https://amrex-codes.github.io/amrex/>
 - same basic structure as CarpetLib
 - build in support for tiling (a la LoopControl)
 - build in support for multi-threading
 - GPU support is work in progress
 - developed as part of DOE ExaScale project <http://exascale.lbl.gov/co-design/>
 - multi-year funding available
 - 10+ team of developers
 - used by CASTRO Newtonian astro code <https://amrex-astro.github.io/Castro/>
 - are in contact with AMReX developers who are interested in adding a BSSN code to their project (will be based on BaikalETK)
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CarpetX

- Cactus "driver" thorn using AMReX as the underlying mesh refinement library similar to Carpet using CarpetLib
 - supports grid functions and grid scalars right now, no grid arrays
 - build in support to output reductions, scalars, BoxSet files (3D, can be read by VisIt) and ASCII files
 - no checkpoint / recovery
 - some support to interpolate to arbitrary locations
- compared to Carpet / CarpetLib
 - feature based refinement using an error estimator
 - built-in is support for refluxing at mesh refinement boundaries
 - built to support the presync diagnostics and requires READS / WRITES statements
 - boundary conditions and restrict applied as part of SYNC
 - no subcycling in time

BaikalX

- fork of Zach's BaikalETK BSSN evolution thorn adapted to CarpetX
 - no radiative boundary conditions anymore
 - some restructuring of scheduled grid functions to support tiling
 - added READ / WRITE statements
 - C++ to use loop_XXX templates in CarpetX, extended NRPy+ to provide looping macros
- have copy of TwoPunctures adapted to CarpetX to provide initial data

Links

<https://amrex-codes.github.io/amrex/>

<https://bitbucket.org/eschnett/cactusamrex>

<https://bitbucket.org/eschnett/cactusamrex/src/master/BaikalX/par/>

<https://bitbucket.org/eschnett/cactusamrex/src/master/azure-pipelines/Dockerfile>