

Abstract Submitted
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The Rad Hydro for Roadrunner Code Project J. WOHLBIER, B. BERGEN, CCS-2, Los Alamos National Laboratory, W. DAI, A. DUBOIS, D. DUBOIS, HPC-5, Los Alamos National Laboratory, T. KELLEY, R. LOWRIE, R. MCCLARREN, CCS-2, Los Alamos National Laboratory — Los Alamos National Laboratory is receiving and testing Roadrunner, the first supercomputer to sustain a petaflop [1]. Roadrunner consists of a cluster of Opteron, with each Opteron core accelerated by one Cell Broadband Engine processor with enhanced double precision capability. We are developing a rad hydro code for this new architecture that takes into account that Roadrunner is just the first of many multi-core, heterogeneous architectures to come. The design has a block AMR direct Eulerian hydrodynamics scheme with separate electron and ion temperatures, working with tabular equations of state, and using various radiation transport schemes. Planned radiation transport schemes are grey diffusion, multi-group diffusion, and IMC transport. Software for Roadrunner and future heterogeneous architectures requires specialized, non-portable code. We are using tools—the SIMD Abstraction Layer (SAL) [2] and the Cell Isolation Kit (CIK) [2]—that aid writing architecture independent software. We report on our plans and progress on the Rad Hydro for Roadrunner project. [1] <http://www.top500.org> [2] Tim Kelley, private communication.

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