

SANDIA NATIONAL LABORATORIES

SNL ADTM

# Monthly report for ECP ATDM ST projects

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**Prepared for:**

ECP Monthly reporting

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### Program models and runtimes

Progress in setting up interface for broad phase contact search with DARMA. Made progress on Qthreads version of miniMS. Miniapp testing is ongoing with load balancing planned next. Made MPI operability work progress

### ATDM Tools and DevOPs

Put up Trilinos/EMPIRE fluid builds. Set up Mutrino which can switch EMPIRE Jenkins pipelines, and planned CUDA builds. Intel and IBM Trilinos builds cleaned. Worked on a better set of tests for Trilinos auto pull-requests builds, GCC, Intel and CUDA.

### ATDM Math Libraries

Worked on SPARC issues with ifpack2 and Kokkos Kernels. Began designing Block CRS in Kokkos Kernels for SPARC to work with multiple layouts. Team members attended PATHFORWARD meetings. Addressed tpetra issues and reduced memory footprint. Work on Refactor, searched for EMPIRE kernels that needed to be converted to Kokkos. Completed EMPIRE hackathon and plan on doing again every other month as it facilitated many decisions being made. TEMPUS integration complete (on branch). Made progress on transient interface to ROL and will be connecting to TEMPUS soon. Interfaced Dakota to EMPIRE/PIC.

### ATDM Data and Visualization

Rebased EMIPRE brand with EMPIRE's latest version. Worked on infin-band issues. Updated SPARC C/R interfaces. Made progress on SPARC/Catalyst integration with NE data paths and demonstrated this on Mutrino. Conducted a code review in preparation of merging. Continued work on Catalyst/TuckerMPI integration.

### ATDM Software Ecosystem

Continued miniMS and Qthreads work. Continued working on Kokkos barriers. Engaged with Vanguard. Worked on Sierra/SM on contract integration and added node/face detailed search algorithm. Began to "DARMAtize" the contact algorithms. Worked with the Sierra team to get RDC working. Identified limitations with regard to linking to Nvidia's device linker.

