



Contribution ID: 27

Type: Poster

## Athena MPI: A Multi-Node Version of ATLAS's Athena Framework, Using Message Passing Interface

*Monday, 11 March 2024 16:15 (30 minutes)*

With the coming luminosity increase at the High Luminosity LHC, the ATLAS experiment will find itself facing a significant challenge in processing the hundreds of petabytes of data that will be produced by the detector.

The computing tasks faced by the LHC experiments such as ATLAS are primarily throughput limited, and our frameworks are optimized to run these on High Throughput Computing resources. However the focus of funding agencies is increasingly shifting towards High Performance Computing resources. As a result we urgently require the capability to efficiently run our computing tasks on these High Performance Computing resources.

One of the first tasks towards implementing this capability is to enable a single instance of the ATLAS software framework, Athena, to run over multiple (tens, or hundreds) nodes. Here we present a multi-node version of Athena that uses the industry standard Message Passing Interface (MPI) to assign work to the various worker nodes.

### Significance

This work presents a preliminary multi-node version of the Athena software framework used for data processing by the ATLAS experiment. This will enable the experiment to make more efficient use of the HPC resources available to it.

### References

<https://indico.jlab.org/event/459/contributions/11444/>

<https://indico.cern.ch/event/1106990/contributions/4991224/>

### Experiment context, if any

ATLAS

**Primary authors:** STANISLAUS, Beojan (Lawrence Berkeley National Lab. (US)); Dr LEGGETT, Charles (Lawrence Berkeley National Lab (US)); ESSEIVA, Julien (Lawrence Berkeley National Lab. (US)); CALAFIURA, Paolo (Lawrence Berkeley National Lab. (US)); TSULAIA, Vakho (Lawrence Berkeley National Lab. (US)); JU, Xiangyang (Lawrence Berkeley National Lab. (US))

**Presenter:** STANISLAUS, Beojan (Lawrence Berkeley National Lab. (US))

**Session Classification:** Poster session with coffee break

**Track Classification:** Track 1: Computing Technology for Physics Research