HPC / HTC Software Infrastructure for the Synthesis and Analysis of CMB Datasets

Julian Borrill (PI) [1,2] Colin Bischoff [3] Thomas Crawford [4] Matthew Hasselfield [5] Reijo Keskitalo [1,2] Theodore Kisner [1,2]
Akito Kusaka [1,2,6] Nathan Whitehorn [7]

[1]U.C. Berkeley [2]LBNL [3]U. of Cincinnati [4]U. of Chicago [5]Flatiron Institute [6]U. of Tokyo [7]U.C. Los Angeles

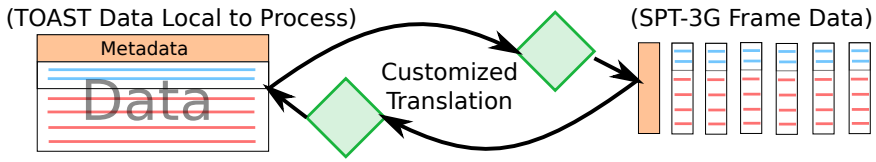
Award #1835865

Two Frameworks, One Workflow

TOAST and SPT-3G are two publicly available software frameworks which are used in modern CMB data analysis and which target different computing models. TOAST was developed for "High Performance Computing" systems (i.e. super-computers) and SPT-3G was developed for use in "High Throughput Comput-ing" scenarios (i.e. the grid). The goal of this project is to enable workflows that include processing elements of both frameworks and which can run on either computing platform when possible.

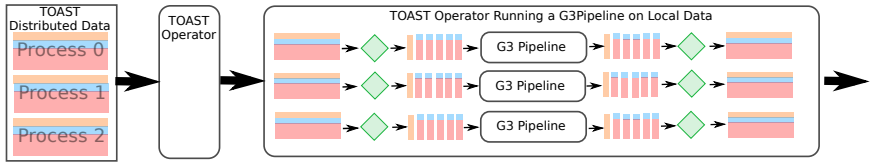
Data Model

A core piece of this work is efficient translation of underlying data between rep-resentations used by the two frameworks. This includes work on simplifying the upstream data models and also developing the interfaces for customizing the data translation for specific experiments.

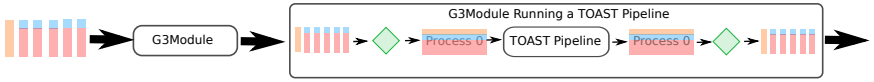


Pipeline Interoperability

Development is driven by practical use cases needed by real experiments. These include running SPT-3G modules within a TOAST workflow on HPC systems:



Running TOAST modules within an SPT-3G workflow on HTC systems:



And running hybrid workflows on HPC systems: