

Energy efficiency in Data Reduction for Imaging in a Radio Astronomy pipeline

Friday, 16 June 2023 09:50 (15 minutes)

The effective exploitation of modern architecture is a key factor to achieve best performances in terms of both energy efficiency and run-time reduction.

We bring a specific example of this, by discussing the *W*-stacking gridder, an algorithm that tackles Radio imaging in massively parallel systems; its performance is limited by an all-to-all data reduction needed to pass from time-domain decomposition to space-domain decomposition.

To overcome this limitation, we have implemented a customized reduce operation built on explicitly numa-awareness.

We have found inside each computing node an increase in both performance and energy efficiency by a factor of 4 to 7 on different architectures.

Primary authors: LACOPO, Giovanni (Istituto Nazionale di Astrofisica (INAF)); Dr TAFFONI, Giuliano (OATS-INAF); Dr TORNATORE, Luca (OATS-INAF)

Presenter: LACOPO, Giovanni (Istituto Nazionale di Astrofisica (INAF))

Session Classification: Radio Astronomy

Track Classification: Radio Astronomy