

ER-flow Application Description Template

<p>Application Name (<i>will be used as workflow name in the repo</i>): LaSMoG</p>
<p>Application domain (<i>choose one existing in the repo, otherwise will be created</i>): Astrophysics</p>
<p>Brief description of application (<i>explain implemented function, inputs, outputs, usage</i>): To understand acceleration of the universe, a weird component is introduced, called dark energy, in the framework of General Relativity (GR). GR needs to be tested on cosmic scales - previous studies show that cosmic acceleration could be realised by modifying GR on cosmological scales without introducing dark energy</p> <p>If GR gets modified, the structure formation will be very different from that in GR, although the expansion history remains the same as in a LCDM universe (i.e. the standard model of big bang cosmology). Observing the large scale structure of the universe could in principle provide new test of GR on cosmic scales. This kind of test cannot be done without the help of simulations as the structure formation process is highly nonlinear. Large-scale simulations are performed for modified gravity models within the Large Simulation for Modified Gravity (LaSMoG) consortium.</p> <p>The workflow produces customised visualisation for analysis of modified GR simulations, more specifically inspecting datasets to discover anomalies by comparing appropriately with datasets coming from standard gravity models.</p> <p>data: input data format: tar archive of standard GR and modified GR simulations (Ramses format) input data value range: output data format: images (.png) and movies (.mp4) coming from the comparisons of the two models. output data value range: sample data (link): ---- application (link): ---- documentation (link): http://www.itp.uzh.ch/~teyssier/Site/RAMSES.html publication (link): http://arxiv.org/abs/1011.1257</p>
<p>Execution environment DCI: (computing, data, VO, etc): Ramses data files will be supported by VisIVO which is gLite enabled and can deal with LCG File Catalogues (LFCs). We mainly use the catch-all A&A VO in EGI and any other VO giving support to the A&A community. middleware: gLite workflow system: WS-PGRADE</p>
<p>Execution characteristics data size (per unit, typical number of units): input temporary output about 6GB^(*) it depends on the produced scientific movies but lower than 4GB ^(*)Largest simulation so far of 1024^3 particles in a 1.5 (Gpc/h)^3 box, standard simulations of 256^3 particles.</p>

processing time (per unit): 1 single job lasts typically 3-4 hours.
memory usage: 4 GB (on each WN) disk usage: 10 GB

Target users

Community: astrophysicists interested to study modified GR. LaSMoG consortium.
Projects (link):

number of users:

user type: Researchers/PhD Students developer: Yes end-user: Yes

Usage scenario for workflow in the ER-FLOW (*how workflow will be reused, meta-workflow, how expected to contribute to project indicators, etc.*).

Scientists are interested in comparing features within regions of interest from original time steps, then tracking such differences throughout a large sequence of snapshots. The users will submit the workflow configuring the input data files and parameters by an easy to use interface (portlet) via a science gateway.

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