University of Glasgow | Experimental Particle Physics

PROGRESS REPORT

PROJECT AQUEOUS

Number 6

School of Physics and Astronomy
University of Glasgow

March 2016

abstract

A brief summary of the report.

acknowledgements

The contributions of Number 2 and Number 1 are acknowledged.

contents

1 introduction

1.1 Higgs bosons

Higgs bosons are particles that arise through electroweak symmetry breaking. A principal motivation for the Large Hadron Collider physics programme was the testing of the theory of electroweak symmetry breaking, through the observation of Higgs bosons. In July of 2012, the existence of the Higgs boson was confirmed by the ATLAS and CMS experiments. Following this discovery, further studies have been ongoing in order to examine the character of the particle.

2 chapter 1

2.1 section 1

This is content.

2.1.1 time

A few time representations follow:

- 2016-03-07
- 7 March 2016
- March 2016
- 142541
- 1425
- 2016-03-07T142541
- 2016-03-07T1425

2.1.2 units

This is a unit: 1 kB.

2.1.3 lists

This is a list:

- function,
- Job,
- JobGroup,
- ParallelJobProcessor and
- pool.

This is a checklist:

✓ item

✓ item

- ✓ subitem
- ✓ subitem
  - ✓ subitem

✓ item

✗ item

2.1.4 code

This is some code:

```
Reco_tf.py --inputBSFile data12.1234.RAW --outputESDFile data12.1234.ESD
```

2.1.5 images

This is a figure set to a defined width:

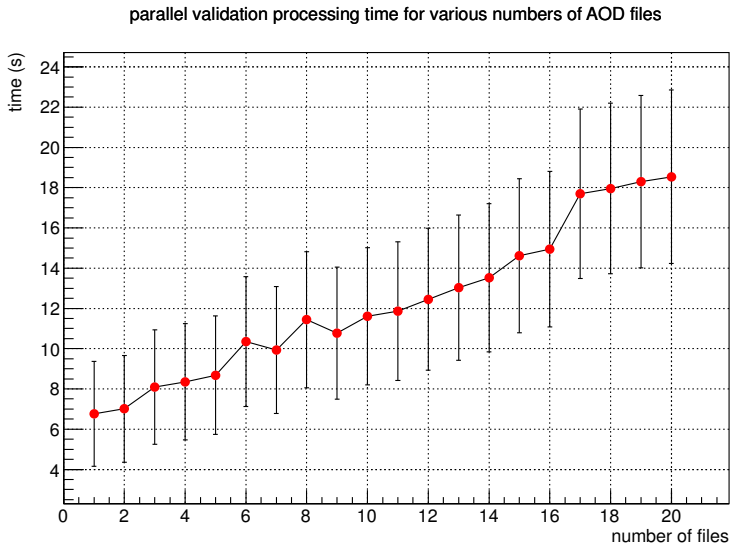

figure 2.1: parallel job processor: large efficiency improvement as a result of parallelisation

This is a figure set to the text width:

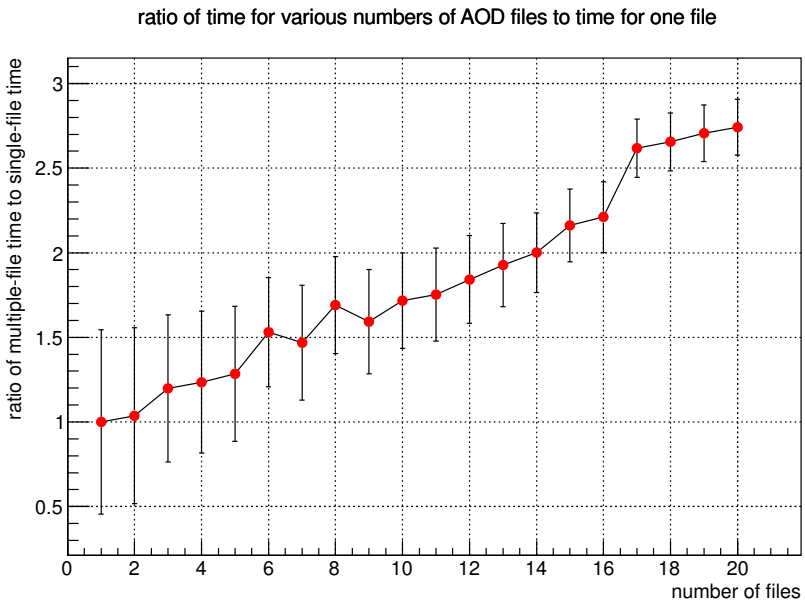

figure 2.2: parallel job processor

2.1.6 references

This is a reference to figure 2.2. This is a reference [1]. This is another reference [2]. This is a URL: https://github.com/wdbm/aqueous

2.1.7 ROOT

ROOT [3] is an object oriented data analysis framework aimed at solving data analysis challenges in high energy physics. While *ROOT* is simply a name, a possible acronym for the system could be *"Rapid Object-Oriented Technology"* [4]. ROOT was developed in the context of the NA49 experiment at CERN. NA49 generated data of approximately 10 TB per run. This rate of data provided a test environment for the development of ROOT, as the next generation of data analysis. ROOT features *Cling*, a C++ interpreter.

2.1.8 tables

input file option	description
`--inputHitsFile`	input only
`--inputBSFile`	RAW data (BS = ByteStream), currently input only
`--inputRDOFile`	
`--inputESDFile`	
`--inputAODFile`	

output file option	description
`--outputRDOFile valid`	if starting from Hits
`--outputESDFile valid`	if starting from Hits, RDO or BS
`--outputAODFile valid`	if starting from ESD or anything else upstream
`--outputNTUP_XXXFile`	can be made from ESD or AOD, BS or RDO

figure 2.3: Reco_tf.py usage

3 future

3.1 future plans and considerations

These are suggestions and plans for the future.

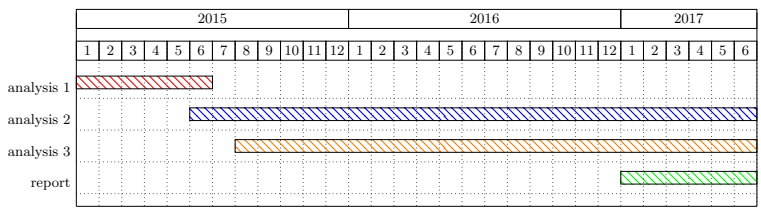

figure 3.1: Gantt chart of work

references

[1] L. Li Tianjun, W. Xia, W. You-kai and Z. Shou-hua, *Distinguishing the Color Octet Axial-Vector-like Particle for Top Quark Asymmetry via Color Flow Method at the LHC*, arXiv:1306.3586 (June 2013)

[2] W. S. McCulloch and W. Pitts, *A logical calculus of the ideas immanent in nervous activity*, The Bulletin of Mathematical Biophysics, 5 (4), 115–133 (1943)

[3] *ROOT: A Data Analysis Framework*, URL `http://root.cern.ch` (November 2012)

[4] R. Brun, *Re: What does ROOT stand for?*, RootTalk, URL `http://root.cern.ch/root/roottalk/roottalk98/0718.html` (May 1998)