

Table of Contents

4.2.4.1 PAT Exercise 01: How to use the PAT Documentation.....	1
Contents.....	1
Objectives.....	1
Introduction.....	1
WorkBook Documentation.....	1
SWGuide Documentation and more.....	2
Exercises.....	3
Review status.....	4

4.2.4.1 PAT Exercise 01: How to use the PAT Documentation

Contents

- Objectives
- Introduction
- Workbook Documentation
- SWGuide Documentation and more
- Exercises
- Review status

Objectives




- Learn how to use the CMSSW and EDM documentation resources.
- Learn how to use the PAT documentation resources.


Introduction

This tutorial will explain how to efficiently use the PAT Documentation. Entry points for typical questions arising about PAT will be given. Finally you may want to go through a small set of exercises to get used to the PAT Documentation. While basic questions are addressed in the Workbook Documentation, advanced problems are discussed in the SWGuide Documentation.

Note:

This web course is part of the PAT Tutorial, which takes regularly place at cern and in other places. When following the PAT Tutorial the answers of questions marked in RED should be filled into the exercise form that has been introduced at the beginning of the tutorial. Also the solutions to the Exercises should be filled into the form. The exercises are marked in three colours, indicating whether this exercise is basic (obligatory), continuative (recommended) or optional (free). The colour coding is summarized in the table below:

Color Code	Explanation
	Basic exercise, which is obligatory for the PAT Tutorial.
	Continuative exercise, which is recommended for the PAT Tutorial to deepen what has been learned.
	Optional exercise, which shows interesting applications of what has been learned.

Basic exercises () are obliged and the solutions to the exercises should be filled into the exercise form during the PAT Tutorial.

Workbook Documentation

The main entry page to light 'weighted' PAT Documentation is the WorkbookPAT. The following basic questions are addressed here:

- WorkbookPATTutorial : I'm newcomer in PAT. Where can I learn more about PAT?
- WorkbookPATGlossary : I don't speak PAT jargon!

- [WorkBookPATOnData](#) : I want to run PAT on data! What do I have to do?
- [WorkBookPATDataFormats](#) : What objects does PAT contain? What is the difference between PAT and reco objects?
- [WorkBookPATWorkflow](#) : How are PAT objects produced? What algorithms does PAT use?
- [WorkBookPATConfiguration](#) : How can I configure PAT to my needs?

You can find the basic information about configuring CMSSW jobs in [WorkBookConfigFileIntro](#) and [WorkBookConfigEditor](#).

SWGuide Documentation and more

The main entry page to a full weight PAT Documentation is the [SWGuidePAT](#). Here you can find links to all available PAT Documentation. This section will discuss how you can find information to address the following two main questions:

- **What are the parameters of a specific PAT object?**

The primary source of information is the [WorkBookPATDataFormats](#). Every PAT object is described here in detail. Please read through this page to get familiar with the functionality available in the PAT objects. You may want to know for example how b-tag information is accessible for jets in within PAT. A link to the [Reference Manual](#) for the `pat::Jet` is provided. Note that you may have to choose the appropriate CMSSW version [here](#). In case you want to study the source code you may look into the [Data Formats](#) definition at Github or search the code using the [LXR](#) cross reference. You will find the answer that `pat::Jet::bDiscriminator` and `pat::Jet::getPairDiscr` are returning all b-discriminators stored in the `pat::Jet`.

Question 1 a):

In addition to the 4-momentum what extra information is available in a PAT muon (you can summarize in categories)?

- **How can I configure a specific PAT algorithm?**

The primary source of information are [WorkBookPATWorkflow](#) and [WorkBookPATConfiguration](#). Here the configuration of the object content, selection and disambiguation are described. Please read through these pages to get familiar with the algorithms available in the PAT and how they can be configured. You may want to know for example how to change the jet algorithm and apply a cut on the jet pt within PAT. Changing the jet algorithm is a matter of the object (content) configuration itself. Applying a jet pt cut is a matter of the object selection. The object configuration section for `pat::Jet` provides a link to the [Reference Manual](#) for the `pat::Jet` producer. The parameter `jetSource` is responsible for changing the jet algorithm. The section about the configuration of the object selection provides a link to the [PatAlgos](#) package at Github, which contains the configuration file `jetSelector_cfi.py`. The parameter `cut` is responsible for applying a cut on the jet pt. Before configuring PAT you should have a look at the available [SWGuidePATTools](#) which provide a set of common methods to configure PAT. There you will find the tool `switchJetCollection` which allows to change the jet algorithm via the parameter `jetCollection`. A much more intuitive way to configure PAT algorithms is by using the [WorkBookConfigEditor](#). It allows to browse available parameters and the available tools, and automatically to create user configuration files with a customised configuration of PAT.

Question 1 b):

What are the three main steps of the PAT workflow and what is the purpose of each step?

Question 1 c):

What tools are available to configure the content of a PAT electron?

Exercises

Before leaving this page try to do the following exercises:

🔴 Exercise 1 a):

🔍 Find out how to access the *JetID* in PAT?

You will find the solution here:

Show ▾ Hide ▾

Solution in Reference Manual🔗: [pat::Jet::jetID](#)

🔴 Exercise 1 b):

🔍 Find out what jet algorithm is used for PAT jets by default?

You will find the solution here:

Show ▾ Hide ▾

Solution in PAT Workbook: *anti-kT with R=0.4 jets*

Same solution using ConfigEditor🔗: [ak4PFJetsCHS](#)

🔴 Exercise 1 c):

🔍 Find out if there is a selection applied to *pat::Jets* by default? You will find the solution here:

Show ▾ Hide ▾

Solution in PAT Workbook : NO

Same solution using ConfigEditor🔗: NO

<!-- 🟡 Exercise 1 d):

🔍 Find out how one can remove b-tagging information from PAT jets? You will find the solution here:

Show ▾ Hide ▾

Solution A in CVS🔗: [process.patJets.addBTagInfo=False](#)

Solution B in SWGuidePATTools:

```
# load the standard PAT config process.load("PhysicsTools.PatAlgos.patSequences_cff")
```

```
# load the coreTools of PAT from PhysicsTools.PatAlgos.tools.jetTools import * switchJetCollectio
```

🟡 Exercise 1 d):

🔍 Find our how to add an additional jet collection to the PAT event content?

🔍 What PAT tool can be used? You will find the solution here:

Show ▾ Hide ▾

Solution in SWGuidePATTools:

```
# load the standard PAT config process.load("PhysicsTools.PatAlgos.patSequences_cff")
```

```
# load the coreTools of PAT from PhysicsTools.PatAlgos.tools.jetTools import * labelAK4PFCHS = 'A
```

⚠️ Note:

In case of problems don't hesitate to contact the SWGuidePAT#Support. Having successfully finished **Exercise 1** you might want to proceed to **Exercise 2** of the WorkBookPATTutorial to learn more about how to create a *pat::Tuple* from a RECO input file. For an overview you can go back to the WorkBookPATTutorial entry page.

Review status

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Reviewer/Editor and Date (copy from screen)	Comments
RogerWolf - 17 March 2012	Added color codes to exercises

Responsible: AndreasHinzmann

This topic: CMSPublic > WorkBookPATDocNavigationExercise

Topic revision: r49 - 2015-06-28 - JustinPilot



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