

# Using Fireworks:

## Viewing CRAFT and MC Events

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# Why View Data?



Help form an 'intuition' about data

Diagnose problems with detector

Debug algorithms

Discover new features to exploit for analysis

Make pretty pictures for talks

It's fun!

# What is CMS' Data?

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## Event Selection

How were a group of events chosen and processed

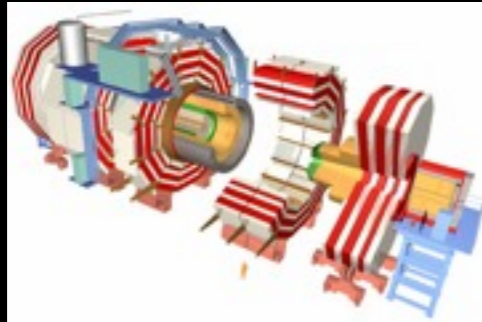
How do you find data files

## Event Content

What information is available in an Event

# Primary Dataset

## Events Grouped by High Level Trigger



010110  
110011  
101000  
0001

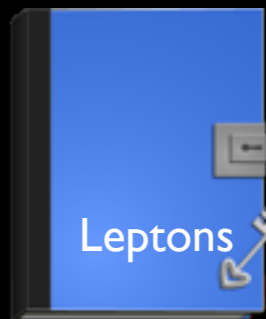
Has Electron?

Has Muon?

Has Jet?

010110  
110011  
101000  
0001

Has MET?



*Must know the primary dataset if you want to get a particular event*

# Process Dataset

RAW data is processed to get physics info

Process uses an official release of CMS software

e.g., CMSSW\_3\_2\_2

Primary Datasets are kept separate

but go through the same processing

Reading of processed data is not guaranteed to always be backwards compatible

*Must use compatible software version when reading data*

e.g., CMSSW\_3\_2\_X can read CMSSW\_3\_1\_X data

e.g., CMSSW\_3\_X can not read processed CMSSW\_2\_X data

# Finding Data

Use the data discovery page

[https://cmsweb.cern.ch/dbs\\_discovery/](https://cmsweb.cern.ch/dbs_discovery/)

The screenshot shows a web browser window titled "DBS data discovery page" with the URL [https://cmsweb.cern.ch/dbs\\_discovery/](https://cmsweb.cern.ch/dbs_discovery/). The page features a navigation menu with links for Dashboard, DBS Discovery (selected), DataTransfer, SiteDB, CondDB, Support, and Login. Below the menu is a secondary navigation bar with links for Home, aSearch, Navigator, RSS, Status, Runs, Admin, Tools, Help, and Contact, along with a View link.

The main content area is divided into two sections:

- ADVANCED KEYWORD SEARCH:** This section includes a dropdown menu for "DBS instances" set to "cms\_dbs\_prod\_global" and a "HELP" button. A search input field contains the query: "find file where dataset = /Cosmics/CRAFT09\*/RECO and dataset.status=VALID and run = 109146". Below the input field are "Search" and "Reset" buttons.
- MENU-DRIVEN INTERFACE:** This section contains several dropdown menus and a checkbox:
  - "Physics groups" set to "Any"
  - "Data tier" set to "RECO", with a checkbox for "composed tier, e.g. GEN-SIM:" and an empty input field.
  - "Software releases" set to "CMSSW\_3\_1\_1\_patch1"
  - "Data types" set to "data"
  - "Primary dataset/ MC generators" set to "Cosmics"At the bottom of this section are "Find" and "Reset" buttons.

# Getting Sample Data

Use the data mover page

<https://cmsweb.cern.ch/filemover/>

The screenshot shows a web browser window titled "CMS File Server" with the URL "https://cmsweb.cern.ch/filemover/". The page has a navigation bar with "DataTransfer" selected. Below the navigation bar, there is a greeting "Hello chrjones:" followed by two buttons: "Request files" (active) and "Request events".

The "Request file via LFN" section contains a large text input field and two buttons: "Request" and "Reset".

The "Request file via dataset/run/event" section has three input fields: "dataset path or pattern (optional)" with the value "/Cosmics/CRAFT09-PromptReco-v1/RECO", "run" with the value "190146", and "event or event range (optional)" which is empty. Below these fields are "Request" and "Reset" buttons.

At the bottom, there is a table listing files with download and remove links:

/store/mc/Summer09/Zee/AODSIM/MC_31X_V3_preproduction_312_AODSIM-v1/0005/A491E807-FE78-DE11-9BEB-0022191F5E8F.root	<a href="#">Download (886.0MB)</a>   <a href="#">Remove</a>
/store/mc/Summer09/Zmumu/GEN-SIM-RECO/MC_31X_V3_preproduction_312-v1/0013/EE567D18-6779-DE11-80F3-00163E1124E2.root	<a href="#">Download (1.0GB)</a>   <a href="#">Remove</a>

# Event Content



A Process can add or remove event data

Data within an event are identified by

C++ class type of the data

the label of the creator module (a string)

the product instance label (a string [often empty])

the process name (a string)

*What data you can look at in the event display depends on how it was processed*



# Running the Display

## Standalone version Linux

```
wget http://cms-service-sdtweb.web.cern.ch/cms-service-sdtweb/fireworks/cmsShow31.tar.gz  
tar xzf cmsShow31.tar.gz  
cd cmsShow31
```

## Get mac version from

```
curl http://cms-service-sdtweb.web.cern.ch/cms-service-sdtweb/fireworks/mac/cmsShow31.tar.gz > cmsShow31.tar.gz
```

## As part of CMS software release

```
scram project CMSSW CMSSW_3_2_3  
cd CMSSW_3_2_3  
eval `scram run -sh` (or -csh)
```

## Run by passing data file

```
cmsShow data.root
```

# CRAFT Demo



# MC Demo



# Summary

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Basic understanding of data needed

*Must know the primary dataset if you want to get a particular event*

*Must use compatible software version when reading data*

*What data you can look at in the event display depends on how it was processed*

Customize for your own needs

Event and object filtering are powerful

Always looking for more help

**Hands on tutorial this afternoon**

# Getting Help

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## Mailing list

`fireworks-support@cern.ch`

## Workbook page

`https://twiki.cern.ch/twiki/bin/view/CMS/WorkBookFireworks`