



e/γ validation for Rome

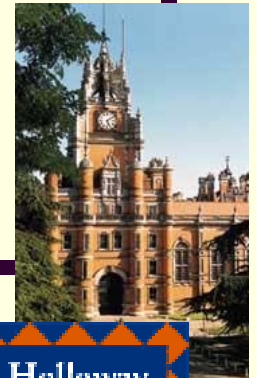
Status of Rome production

What's available in release 10.0.1

Tests and e/γ efficiencies

Ongoing work and future plans

Ricardo Goncalo for the e/γ group



Royal Holloway
University of London

Rome production

- Most jobs with **offline reconstruction only** are now done
- **Problems:**
 - **Generation** of a few datasets; must be re-done
 - TWiki page with info on Rome production problems:
<https://uimon.cern.ch/twiki/bin/view/Atlas/RomeProblems>
 - See also Ian Hinchcliffe's talk in validation meeting yesterday
- First batch of **pile-up jobs** have finished
- Pile-up production should end by end of next week
- **Trigger+offline** reconstruction will be done the week after
- **~10% of production will have trigger information**

Available in release 10.0.1

- Rome reconstruction to be done with 10.0.1
- LVL1:
 - Using **old TT simulation** (i.e. forming Trigger Towers from “offline” cells) ⇒ **resolution is ~2x “too good”!**
- LVL2:
 - T2Calo: a few variables **not filled correctly** (T2CaEMrad1; T2CaEMwid0, ..2, ..3 ⇒ **important for hadronic tau trigger**)
 - Tracking: as before in CBNT; TrackParticles in ESD (but: **no truth association**; no drift circle info for TRTxK)
- EF: (see previous talk by Patricia)
 - EM cluster (TrigCaloRec) reconstruction runs within LVL2 sequence
 - Offline reconstruction for all other algorithms

To run trigger+offline reconstruction

- **Documentation** on 10.0.1 trigger software/Rome productions partly available at:

<http://atlas.web.cern.ch/Atlas/GROUPS/DAQTRIG/PESA/egamma/rome.html>

- To run trigger+offline:

- Transformation scripts in:

`Trigger/TriggerRelease/scripts`

to produce ESD/AOD/CBNT

- Notes:

- `rome.reco.trig.trf`, `rome.reco.trig_lowpt.trf`
don't work
- `rome.reco.trigEF.trf`,
- `rome.reco.trigEF_lowpt.trf`
for LVL1/LVL2/EFCalo/offline

Tests before official production

- Many jobs run at RAL (Monika)
 - Most were ok
 - A few had problems:
 - 1 job got into endless loop (!)
 - A few jobs died due to xKalman (called by TRTxK)
 - Lots of memory needed (~1GB)
 - A(450)→ $\tau\tau$ needed more (!)
- Files can be found at:
[/castor/cern.ch/user/m/mwiellers/test1001/](#)
in directories [AOD/](#), [ESD/](#), [CBNT/](#)
- Samples are: **e25**, **e25+pileup**; **Z→ee**; **W→ev**;
A(450)→ $\tau\tau$

e/ γ efficiency

Notes:

Tuning from DC1 was used; will be re-done for Rome

Only 800 events

e25i	No pileup		Pileup L=10 ³³	
	SiTrack	IDScan	SiTrack	IDScan
10.0.1				
LVL1	96.8%	96.8%	96.8%	96.8%
LVL2 Calo	94.7%	94.7%	93.4%	93.4%
LVL2 ID	88.2%	86.6%	87.7%	84.8%
LVL2 ID and ID-Calo	84.1%	84.4%	83.4%	82.6%
EF Calo	81.7%	82.0%	79.1%	77.8%
EF ID match (iPatRec)	78.5%	77.3%	75.2%	72.9%

Within statistical uncertainties IDScan and SiTrack track finding efficiency is the same with and without pileup

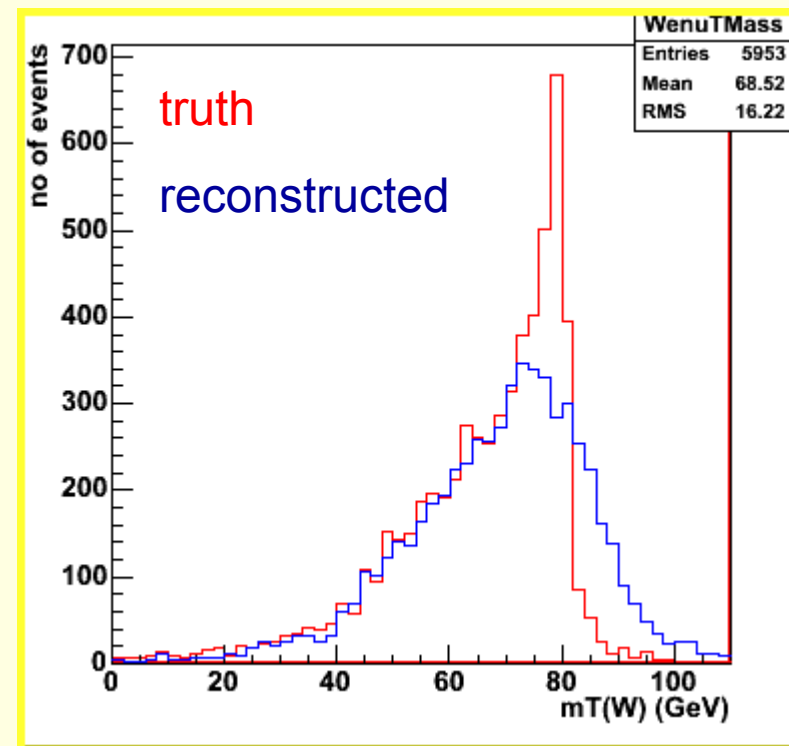
As expected, calo shape variables reject more events with pileup

Pileup production looks ok at first glimpse

See Monika's talk in physics validation meeting yesterday for

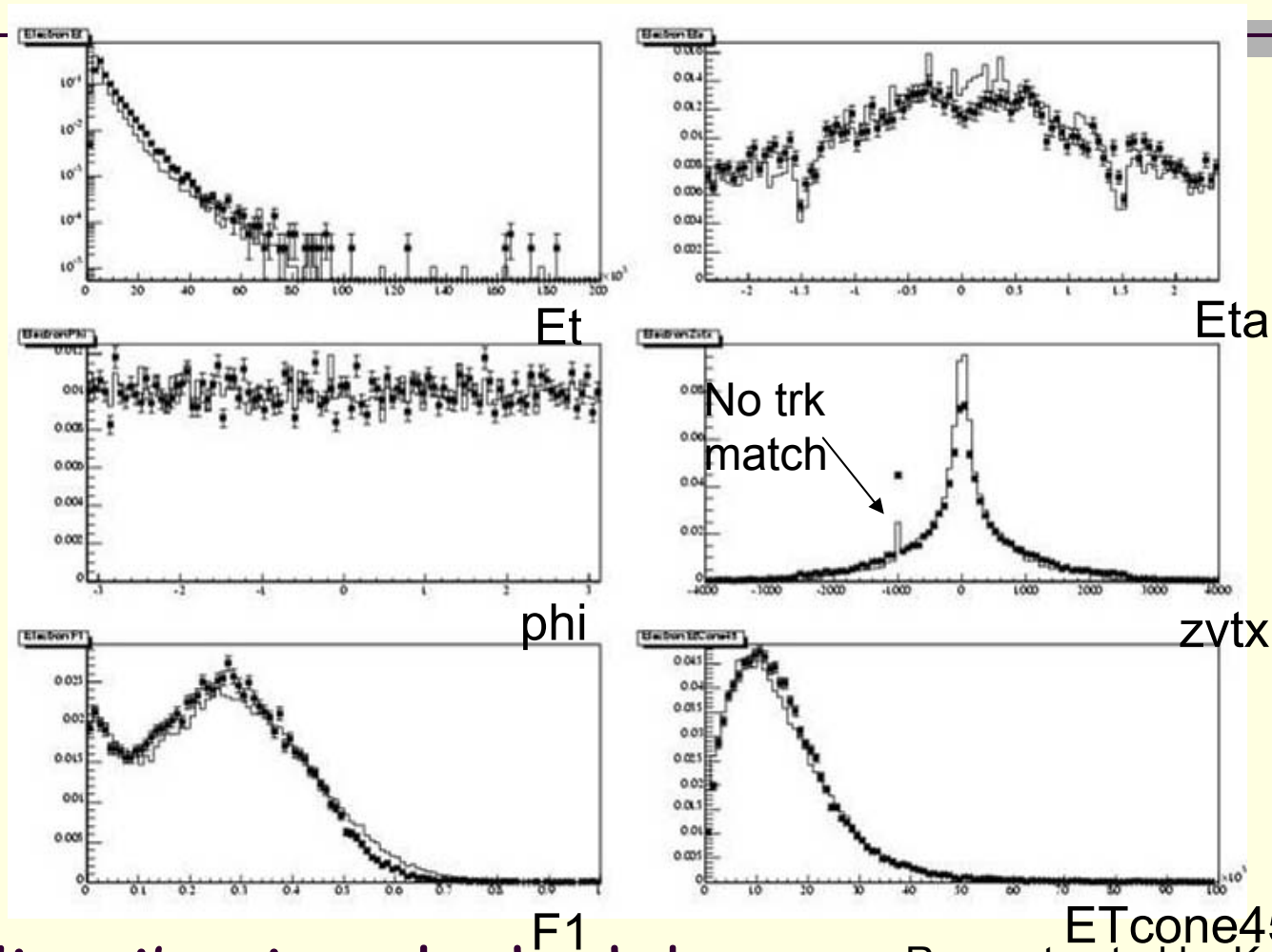
Validation

- It's important to validate our data to ensure we can use it for studies
 - For example, in first iteration of dijet ($E_T > 17\text{GeV}$) sample, filtering went wrong
- Also, to get the full dataset, we must show interest in the first batches that are produced
- Validation work by Tania, Graham and Monika



Transverse W mass
 $W \rightarrow e\nu$ dataset 4203

Filtered dijets with $E_T > 17\text{GeV}$ (DS3025)



All distributions look ok!

27 April 2005

PESA Performance @ TDAQ Week

Reconstructed by Kamal,
Validated by Tania



Ongoing work for Physics workshop Rome

• TB studies

- e/π separation in TB2004
 - Valeria, Manuel, Julie

• Physics and pre-scaled triggers

- Re-do rates/eff for standard physics triggers:
 - $e25i$, $e60$ (Tania, Antonella, Monika)
 - $\gamma60i$, $2\gamma20i$ (Eric, Olivier, Xin)
- Study lower p_T pre-scaled triggers down to $\sim 10\text{GeV}$
 - $e10i$, $e15i$, $e20i$ (Tania, Antonella, Monika)
- Check on some physics channels $Z \rightarrow ee$, $W \rightarrow ev$, $H \rightarrow \gamma\gamma$ events
 - Tania, Antonella, Eric, Graham, Olivier, Xin, Denis, Monika
- How to extract trigger eff using $Z \rightarrow ee$
 - Manuel
- Provide trigger selection to physics community for ESD's/AOD's
 - Monika, Ricardo

• System performance

- Timing for algorithms and data preparation (LVL2 + EF)
 - Cibran, Patricia, Carlo, Dmitry, Nikos ...



Other ongoing work (going also beyond Rome)

- More algorithmic/technical side
 - Complete and fully validate EF implementation
 - Cibran, Patricia
 - Continue timing studies
 - Put trigger results in hypothesis algorithms
 - Re-iterate on ESD/AOD implementation
 - Figure out "best use" of LVL2 tracking (IDscan/SiTrack, best use of TRT information)
 - Graham + ?
 - Re-write/validate Root analysis e/g Framework
 - Mark, Tania, Ricardo
 - Automatic Optimization procedure for efficiency vs. rate curves
 - Physics validation of new releases
 - Monika



More physics performance side

- Switch to new L1 trigger tower simulation
- Study monitor/calibration trigger
- Study mixed triggers $e+ET_{\text{miss}}$, $e+\mu$
- Efficiency vs. rate curve for different trigger items
- Robustness studies (calibration, misalignment, dead/noisy cells/sectors)
- Study other complementary methods to extract and cross-check efficiencies from physics not only using $Z\rightarrow ee$. Forced Accept, crosscheck $Z\rightarrow ee$ vs $W\rightarrow e\nu$...
- Photon conversion and bremsstrahlungs recovery reconstruction at the EF. There is overlap with offline.
- Evaluation of possible new triggers (bandwidth, technical feasibility, performance) before implementation
 - Here of course physics groups have to give us the input

Announcement

- Short weekly meetings up to Rome to check on progress
- Thursday afternoon proposed