First look at Isolation with Pixels

(for 25 GeV trigger threshold)

First look = more problems than fun

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Strategy

use Tracker/PixelReconstruction by D. Kotlinski (PSI)

WITH PIXEL TRACKS AND VERTICES
- reconstruct Pixel tracks
- look for reconstructed track ($\text{Pix}_\mu$) around L2 muon
- calculate $\sum p_t$ of Pixel tracks (excluding $\text{Pix}_\mu$) in predefined cone
- possibly count only tracks with from the same vertex as $\text{Pix}_\mu$.

WITH PIXEL HITS
- reconstruct Pixel hits
- look for hit densities around L2 muon
Data generated:

6000 $W \rightarrow \mu$
5000 MB (approx. 1000 $\mu$ with $p_t < 20$ GeV)
and pileup
cmsim121
digitised and processed with ORCA440 optimised + patches

ntuples made:

standard mpg.ntup and mix.ntup jetmet.ntup (relatively no troubles)
pix.ntup Huge problems: only 1/5 (3/5) of MB (W) sample processed

Private processing of data samples is a PAIN
problems with L1 reconstruction
(hopefully only in our ntuple)
Drop in endcap Pixel track rec. efficiency
(addressed to DK)

Some distributions (1)

The most up-to-date code used for official "production" MUST be always available in $CMS_PATH/Physics/muon/...
Some distributions (2)

Pixel track closest to Generated muon

Distance between L2 muon and Generated muon

Distance between highest $p_t$ Pixel track in $\Delta R = 0.04$ cone around L2 muon and generated muon.

**good result!**
Preliminary Results

Small statistics: ~ 1000 W ev, 65 MB ev.

$\sum p_t$ threshold set to get 97% efficiency for W sample (for events with Pix$\mu$ identified)

| $|\eta| < 0.9$ | VX identification | $\approx 29\%$ |
| $|\eta| < 0.9$ | no VX identification | $\approx 32\%$ |

$\Delta R <: 0.05 \quad 0.1 \quad 0.2 \quad 0.3 \quad 0.4 \quad 0.6 \quad \Delta R <: 0.05 \quad 0.1 \quad 0.2 \quad 0.3 \quad 0.4 \quad 0.6$
Isolation with Pixels
- clarify endcap Pixel track reconstruction problem
- continue with Pixel hits

Try with MC information
where is the limit?

Check results with different samples (after Catania)