L3MuoCentralMatch
L3MuoLocal
Performance Studies

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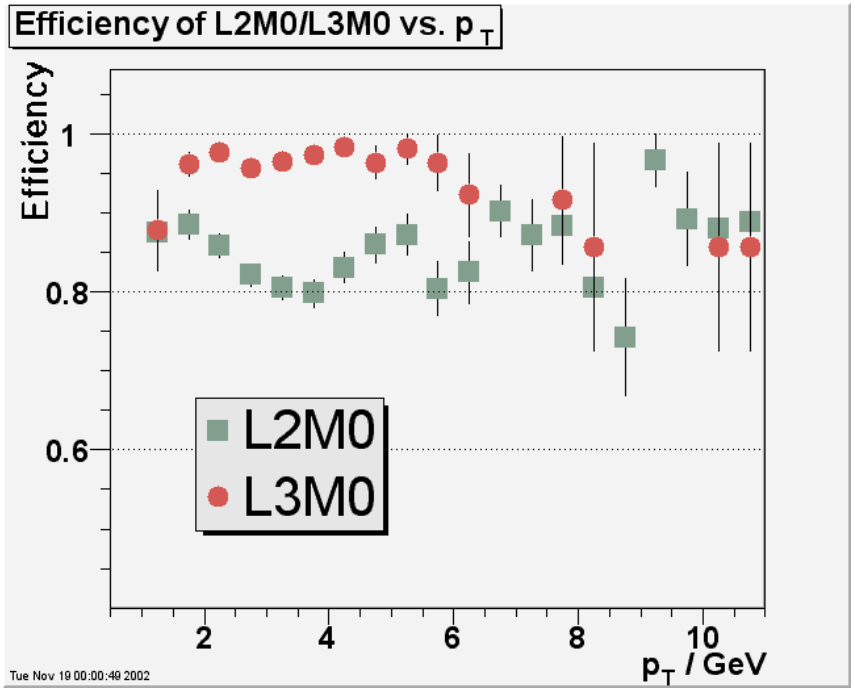
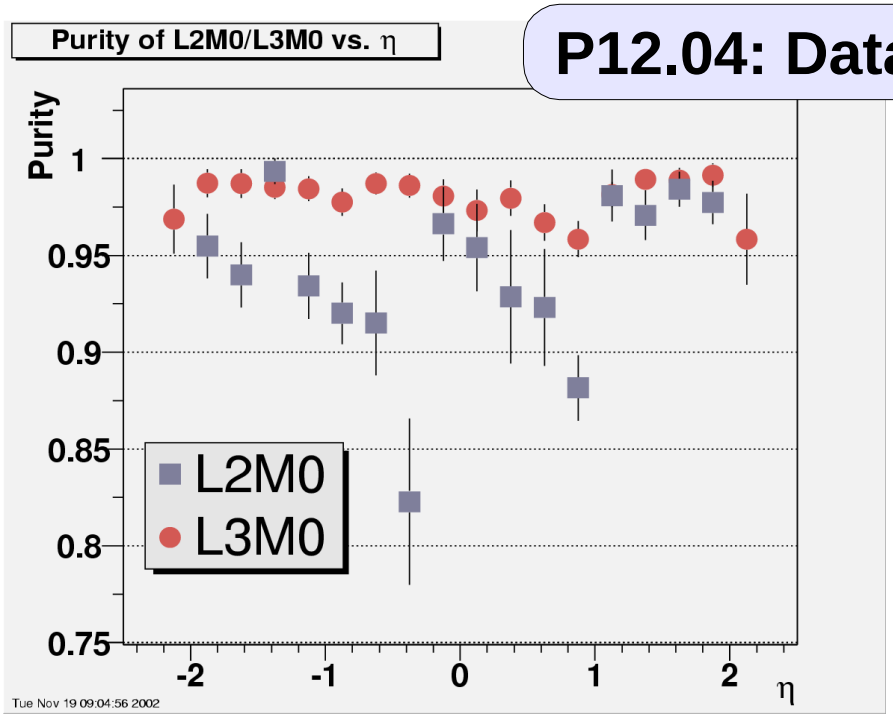
L3 Algorithms Meeting, Dec 18, 2002

- Efficiencies
- Studies with Physics samples (J/Ψ)
- Performance with p13

Efficiency and Purity: L3 local vs. L2

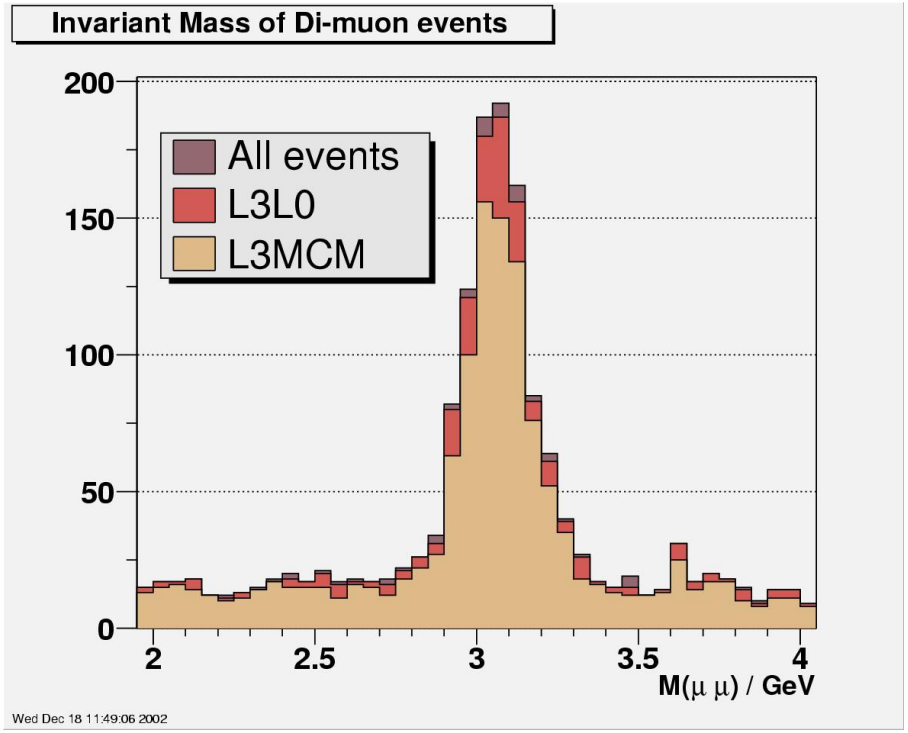


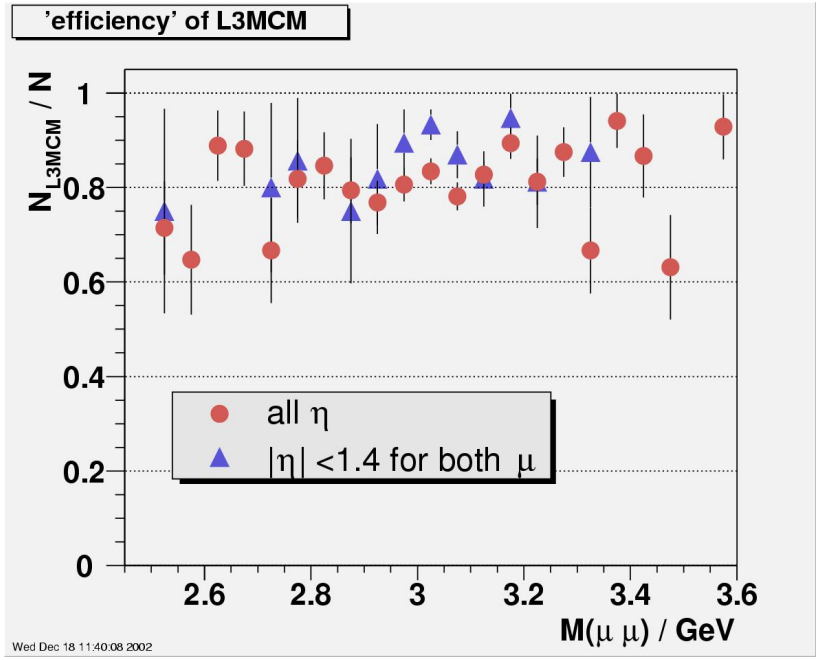


P12.04: Data

- **In the present version L3M0 (local filter) yields a better efficiency and purity than L2 (medium)**
- **Caveat: Improved L2 geometry is *not* yet used in these plots.**

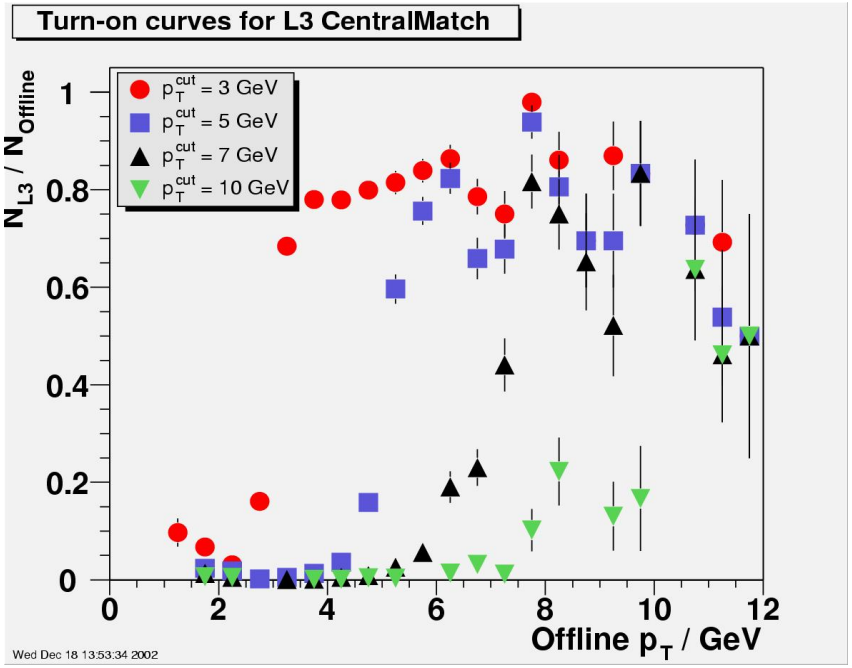
Trigger Efficiency with $\mu\mu$->J/Ψ

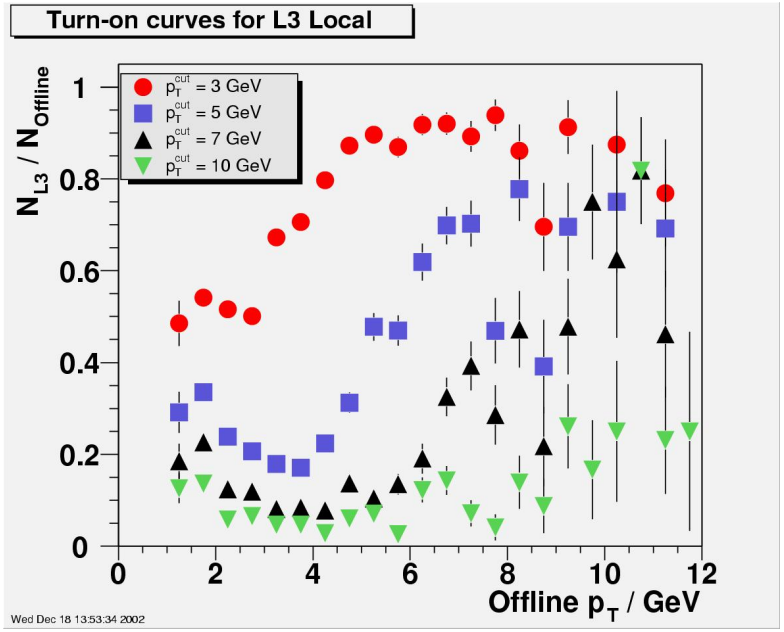




- **Dataset: streamed sample of 30000 medium di-μ events**
- **Reco + TrigSim: p12.04**
- **Probability to trigger one muon with L3MCM: 81.5%**
- **Efficiency slightly higher if $|\eta|$<1.4 ("wide region") required for both muons**

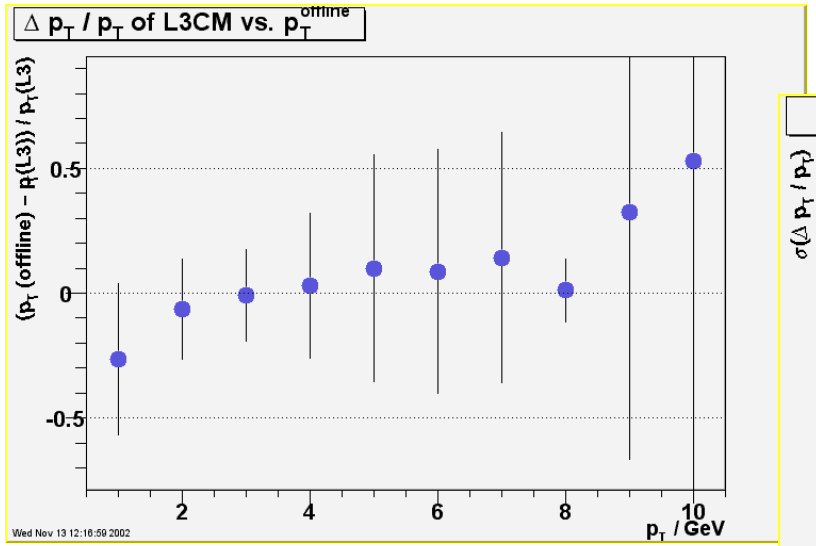
Turn-on curves for L3MCM and L3M0

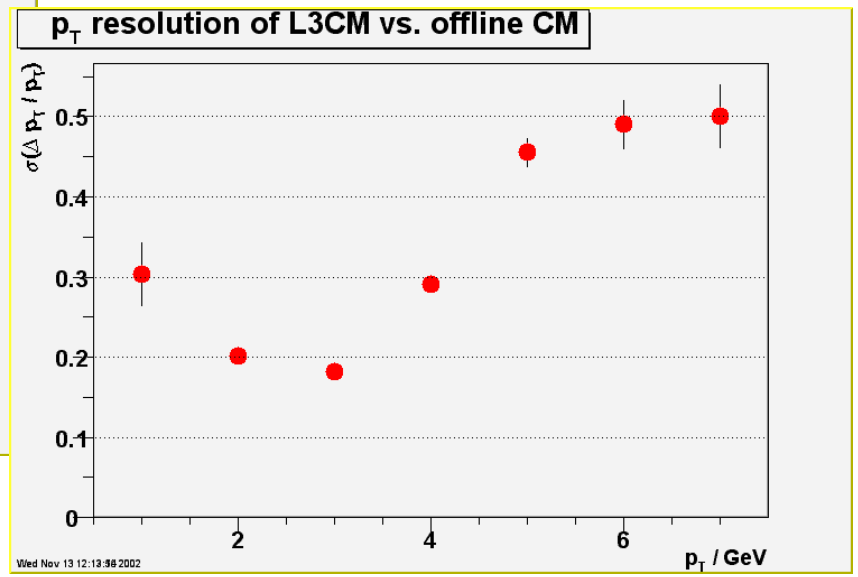




- **Turn on curves much sharper for CentralMatch**
- **For $p_T \leq 5$GeV L3CM turns on within 1 GeV**
- **Plateau efficiency ≈ 80% with respect to offline CentralMatch**

p_T resolution of L3 Central Tracks



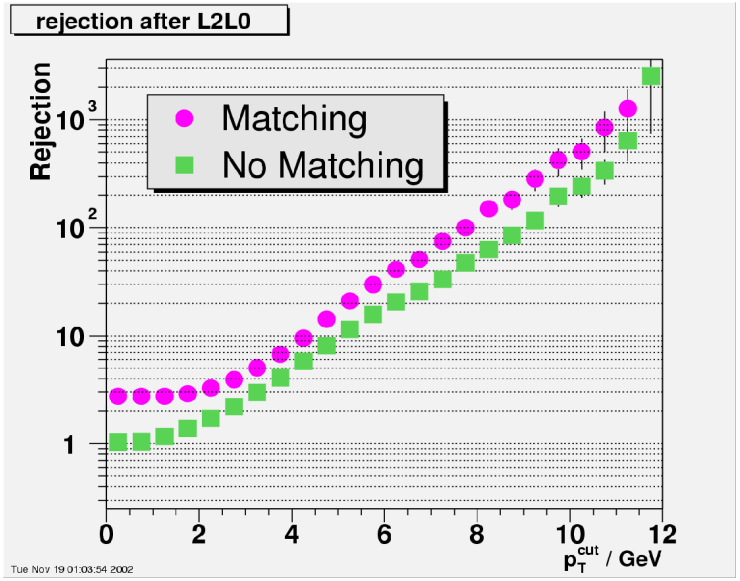


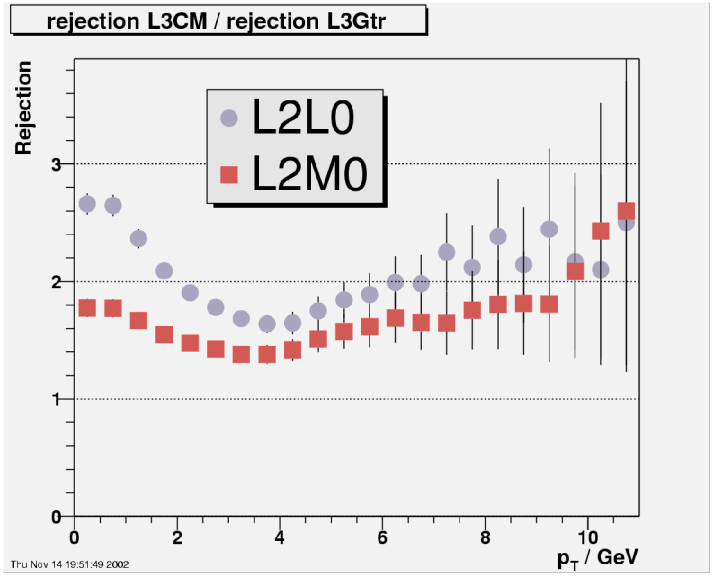
- **Only events with exactly one medium offline muon used to avoid mis-matching**
- **L3 and offline muon checked for consistency**
- **p_T resolution calculated for matching central tracks**
- **It could be better!!**

Where are the tracks "lost"?

- **Matchin Centracl Tracks being found offline, but not in L3CentralMatch:**
  - **Used data sample:**
    199 out of 12531 offline matches were not found
    - **Outside angular range: 7**
    - **pT too low in L3: 33**
    - **Not found by L3 tracking tool: 159**
  - **Efficiency is acceptable!**
  - **L3 Tracking tool is the main source for inefficiency**

Matching versus (independently) adding a Track Filter





- By requiring a *matching* central track one gains a factor of 1.5-2.5 in rejection