Testing 5.3.1 Silimap using J/ψ

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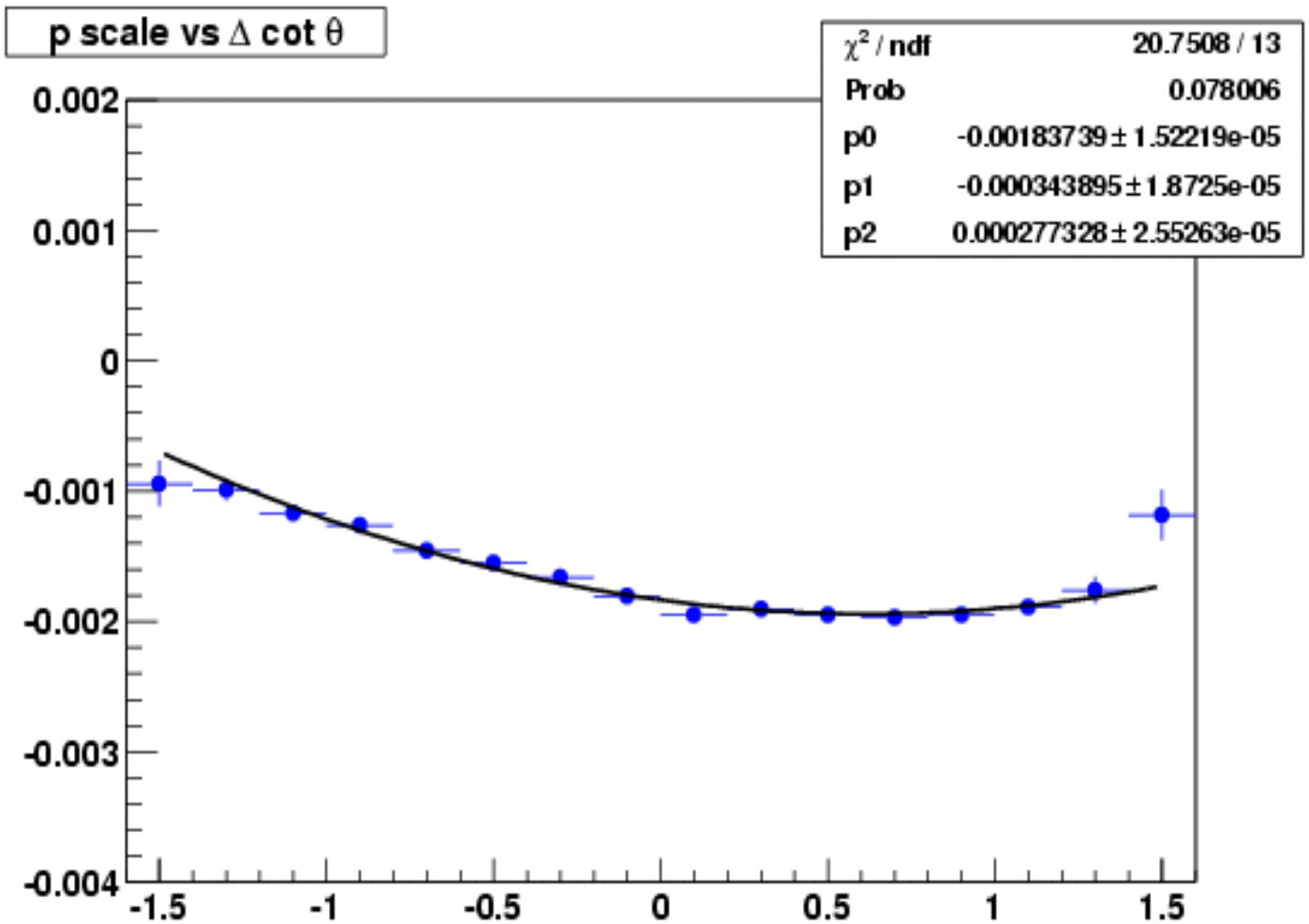
- W mass template generation method:
  - use fast hit-level tracking simulation
  - Use Silimap to sample parameters of Bethe-Bloch formula for ionization energy loss as a function of (r,ϕ,z)
  - Step tracks from vertex through material map to COT, implementing energy loss and multiple scattering
  - Deposit hits, and fit them to tracks

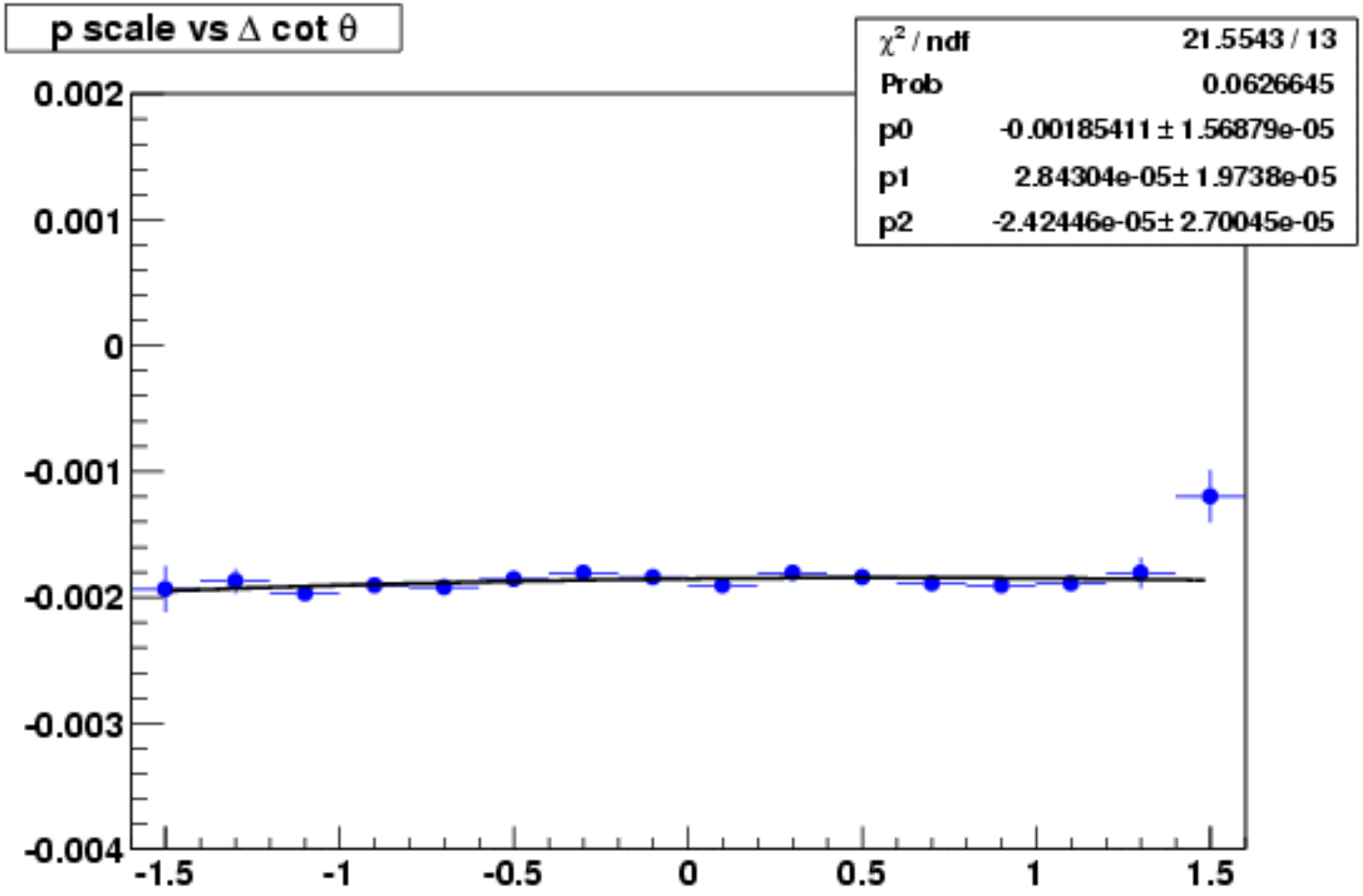
J/ψ mass vs Δcotθ

Need z scale of 0.9994 (stereo angle adjustment) and
curvature correction vs cot θ to correct for simple relative endplate rotation



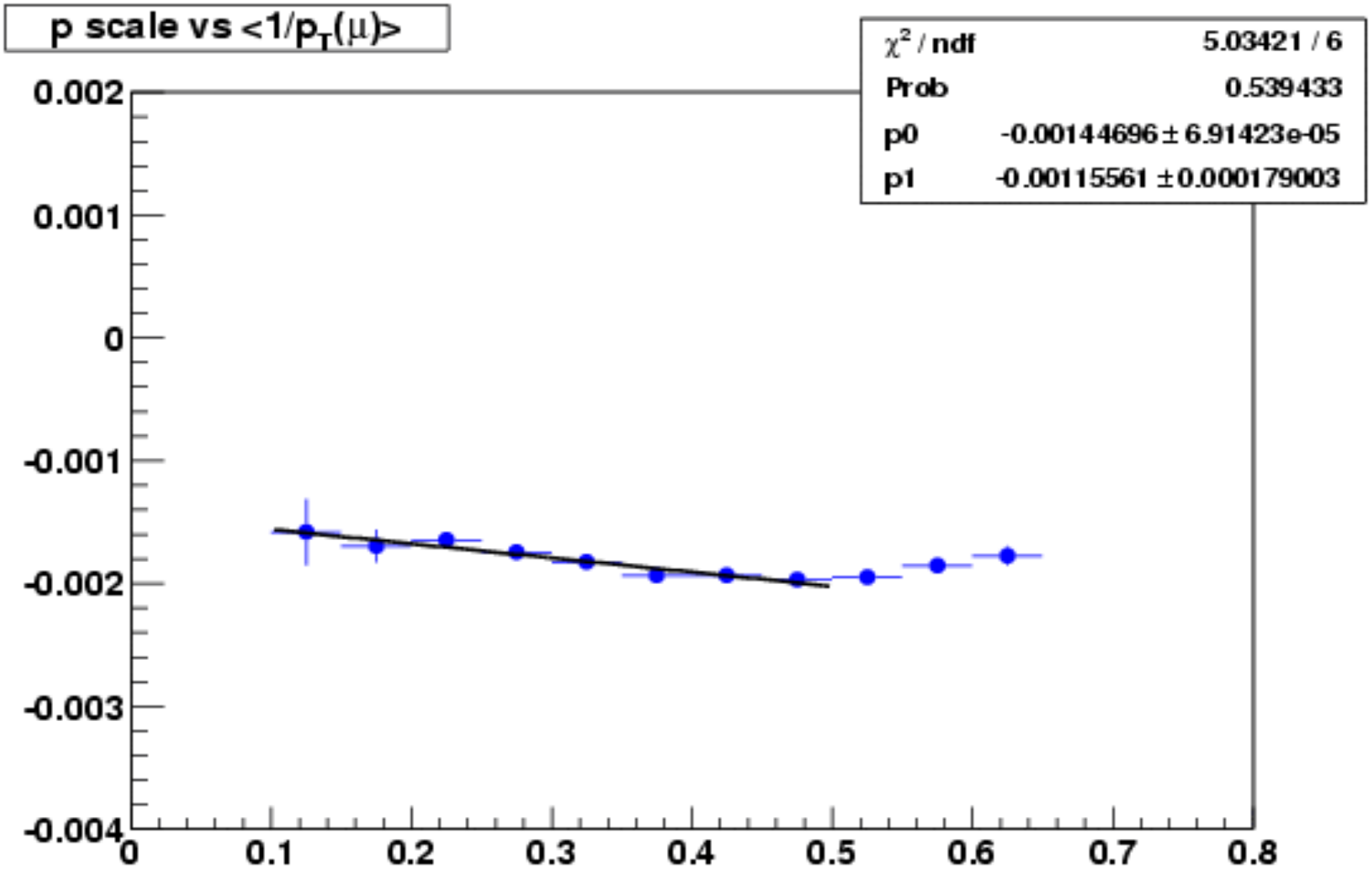
J/ψ mass vs Δcotθ

- Flat after cot θ corrections
- Reflects into mass vs curvature, hence important for validation of material map



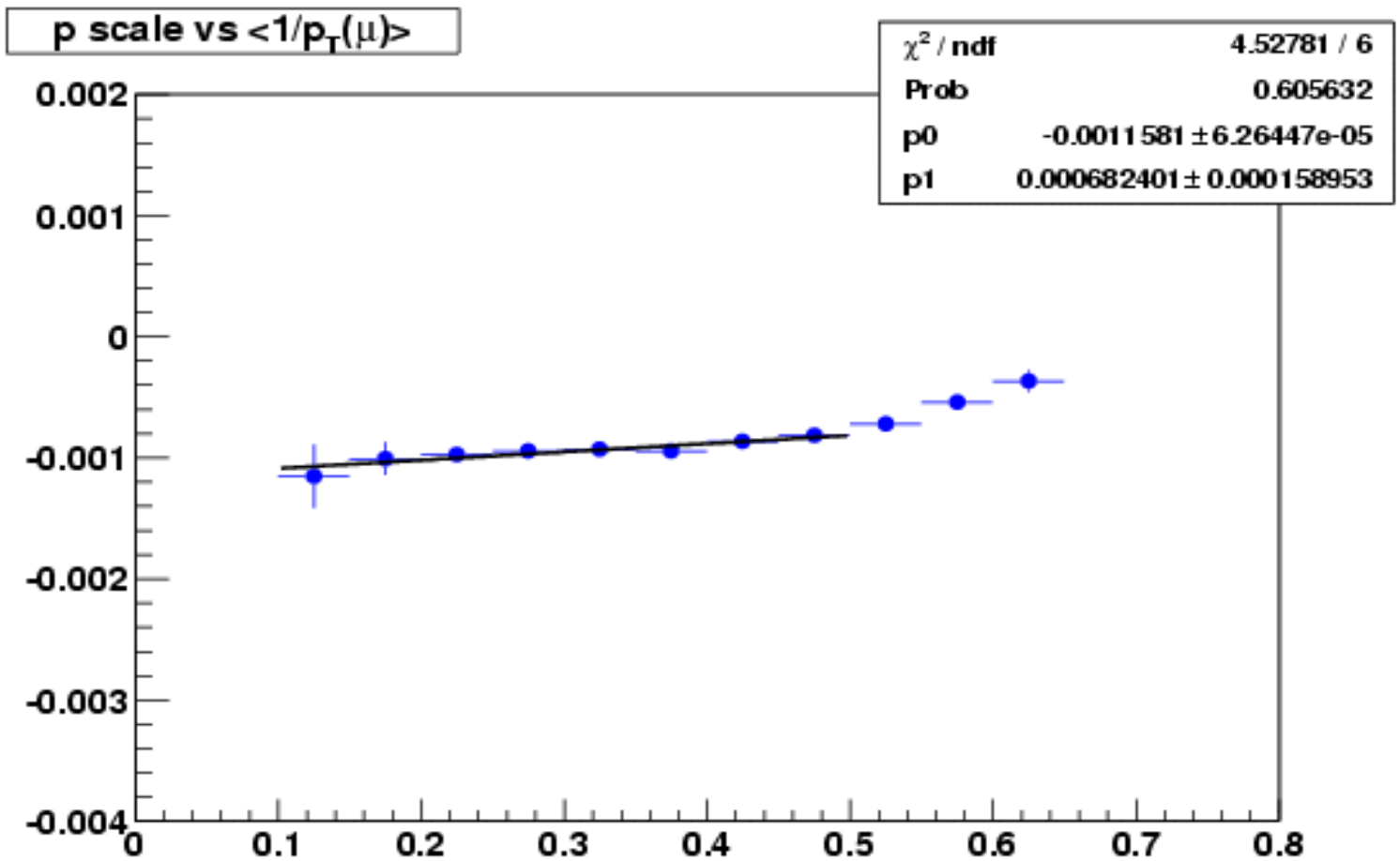
J/ψ mass vs curvature – 4.9.1

- Negative slope implies missing ionization energy loss



J/ψ mass vs curvature – 5.3.1

- Positive slope implies a little too much ionization energy loss
- Mass vs Δcotθ is still flat –
  - Therefore COT z corrections are independent of material



E/p using 5.3.1

- Studying E/p tail from W's, radiation lengths from Silimap agree
  - Fractional X_0 tuning needed is +4% (compared to 35% with 4.9.1)
- Consistent with tuning on photon conversions, adding copper
- Do we have a little too much hydrocarbon in the geometry now?
  - Low Z material is invisible to electrons/photons
    - only shows up in muon energy loss
- Will find out how reduction in muon energy loss needed to “get it just right”
- William T. says “check plastic at R=17 cm”