Fitting the Profiles of CEM Tower Response to Hadrons

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What this is all about

- Get the expected EM energy deposition in a tower from charged hadrons as a function of:
  - Track momentum
  - Position of track hit (in terms of local η, ϕ coordinates), account for leakage
  - Track charge

- For more info see previous talks by Andrea *et al.*
- For definition of “extended local coordinates” see my talk from Nov 6, 2003

Procedure/plan

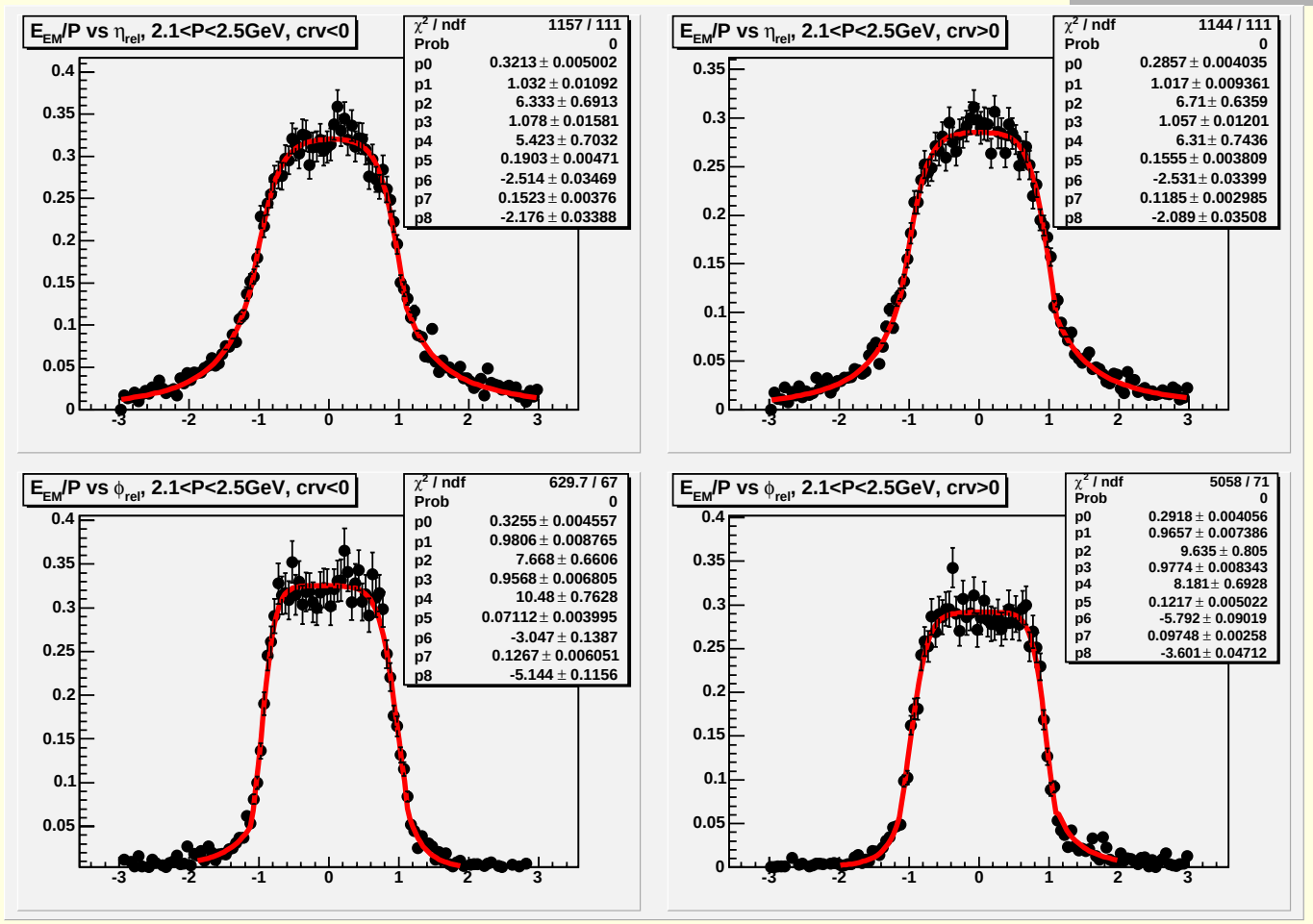
- Make 1D fits for η and ϕ
  - Require $|\eta_{rel}|<0.4$ for ϕ fit
  - Require $|\phi_{rel}|<0.6$ for η fit
- Use results to construct 2D functions

- Today – some preliminary 1D fits
- Use 1-track trigger (data from Steve K.)
- Will use Min Bias as a consistency check

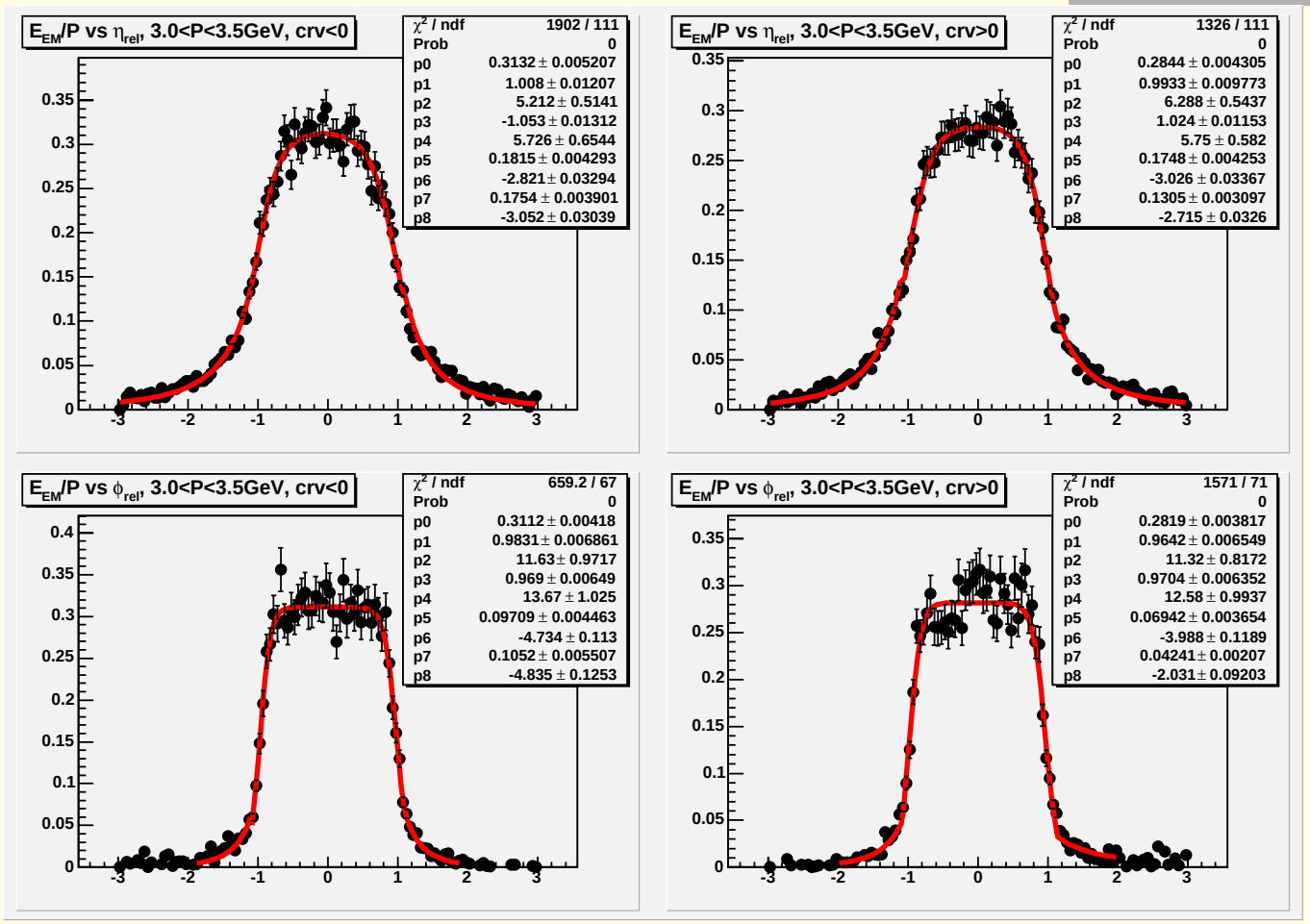
Status

- Fit function:
  - Fermi for central region, exp for the tails
  - Need different coefficients for left/right (asymmetric profiles)
- Fits not perfect:
  - Low P range is real pain – needs work
  - Need to rebin the high end (low stats)
  - Intermediate region - examples shown in following transparencies

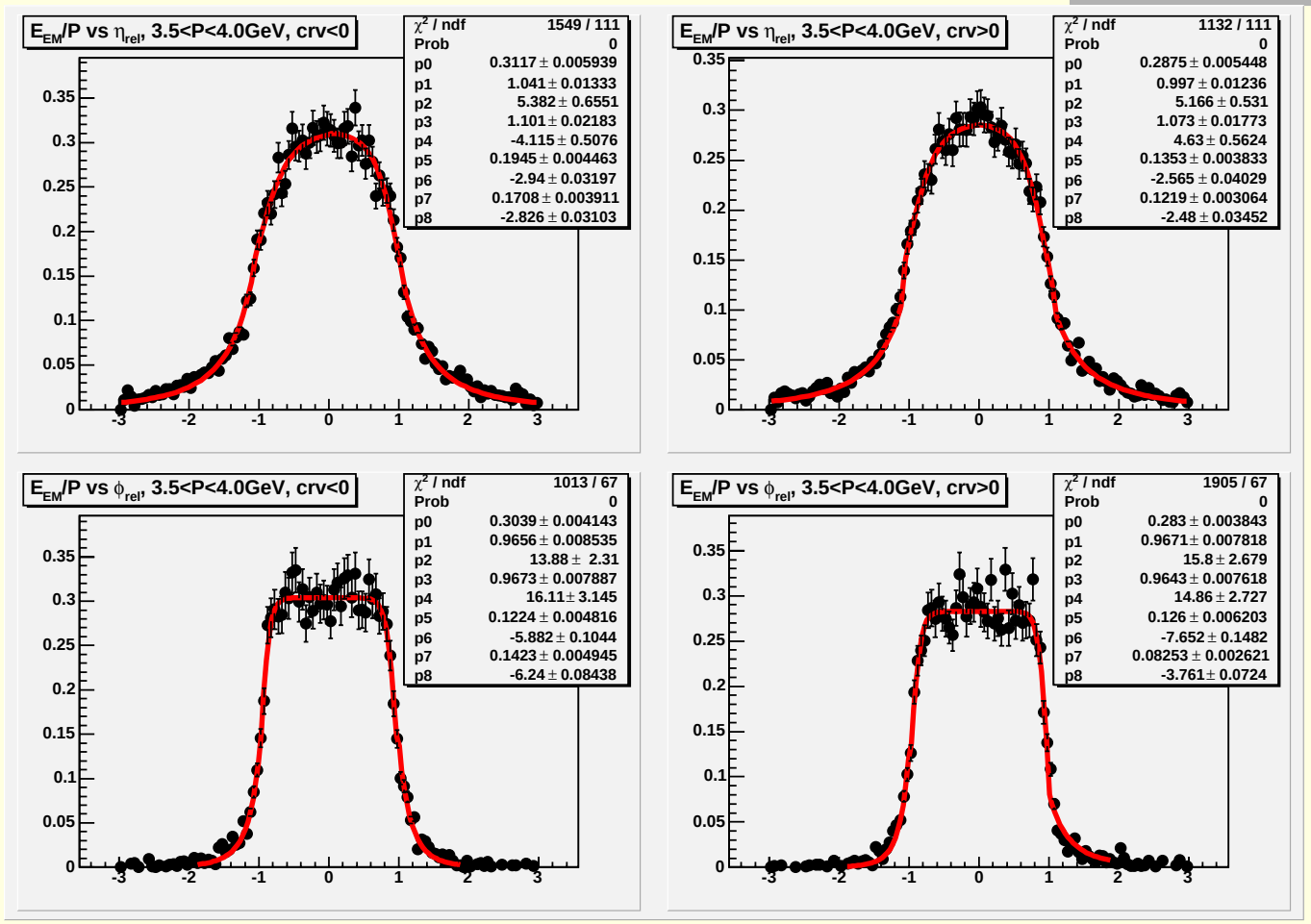
Example fits: 2.1<P<2.5 GeV



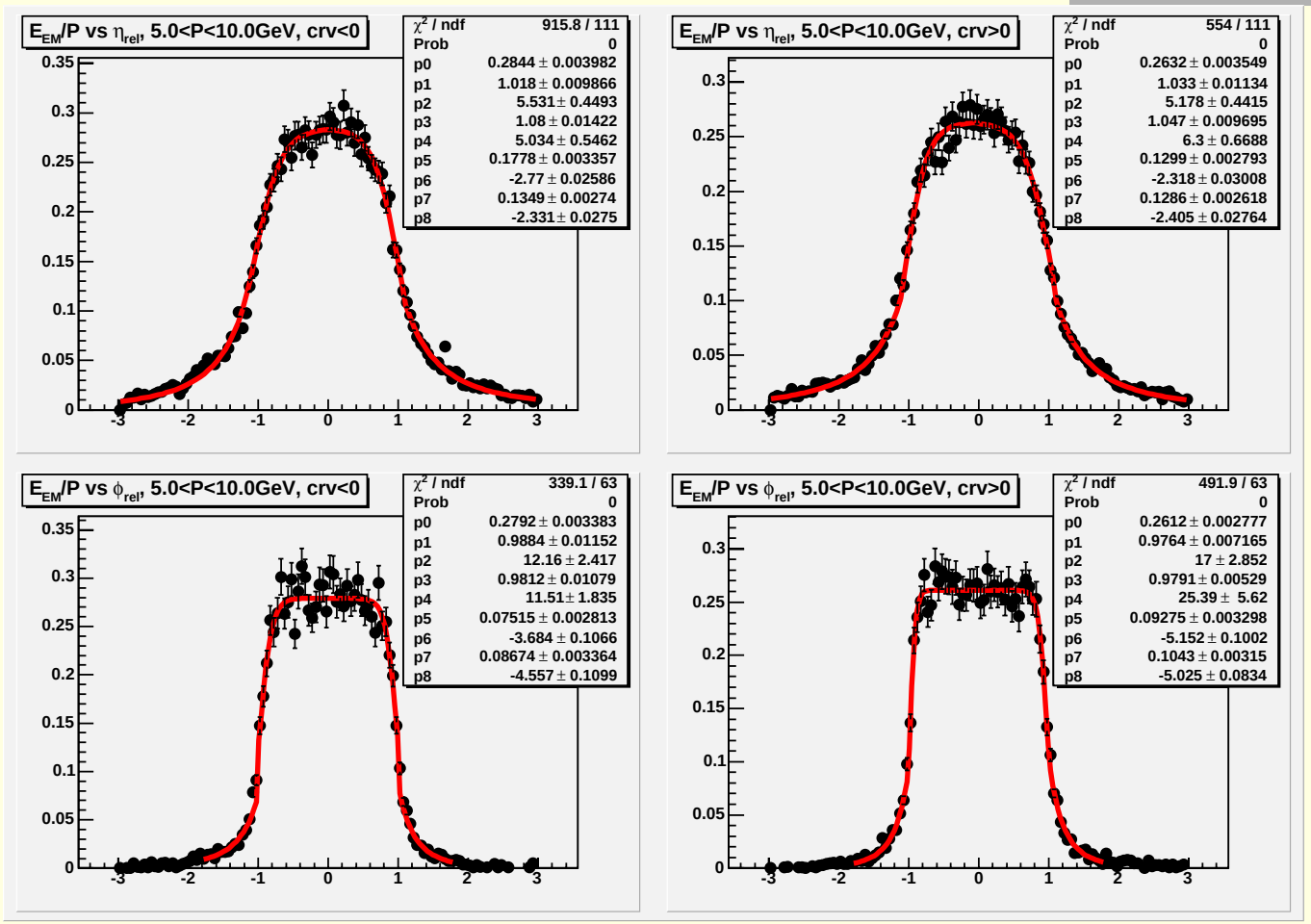
Example fits: 3.0<P<3.5 GeV



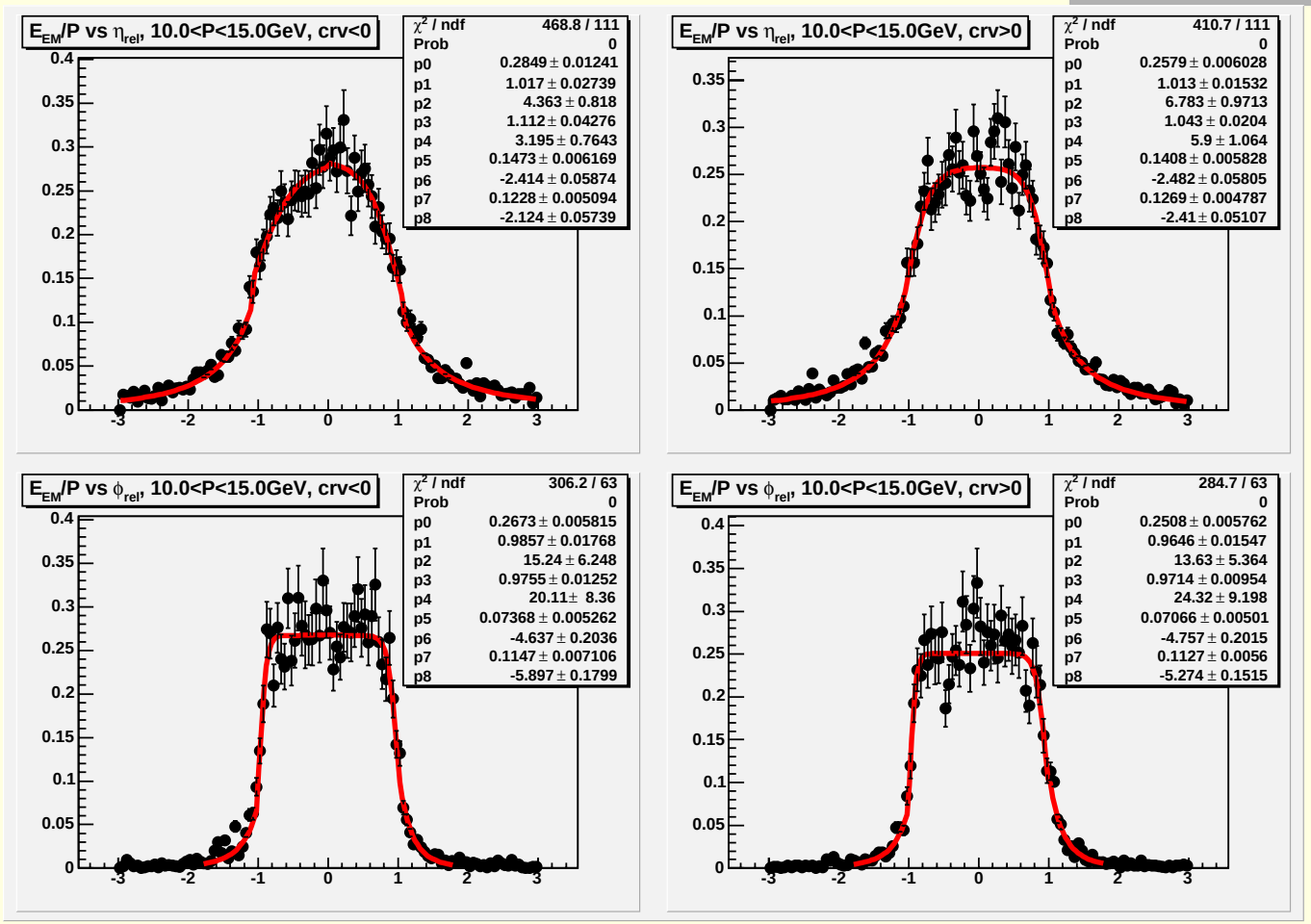
Example fits: 3.5<P<4.0 GeV



Example fits: 5.0<P<10.0 GeV



Example fits: 10.0<P<15.0 GeV



Comments/plans

- χ^2 is not great, but fits look promising
- Need to understand some peculiar features of the distributions

- For next meeting:
  - 2D functions
  - Validation on control sample