Multiplicity fluctuations in Pb+Pb collisions at energy 40 AGeV

Results for single phototubes

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Data set:

Pb+Pb 40 AGeV minbias 02C

Event Cuts:

- VertexX (-0.1,-0.1);
- VertexY (-0.2,0.2);
- VertexZ (-581.4,-580.8);
- X_{bpd} - X_{fit} (-0.08,0.08);
- Y_{bpd} - Y_{fit} (-0.06,0.06);
- Z_{bpd} - Z_{fit} (-0.4,0.4);

Track Cuts:

- Only negative particles;
- Bx(-4.0,4.0);
- By(-2.0,2.0);
- NMaxPoint(3,25,240);
- NPointToNMaxPoint(3,0.5);
- $0.005 < p_T < 1.5$;
- $3.5 < y < 4.75$.

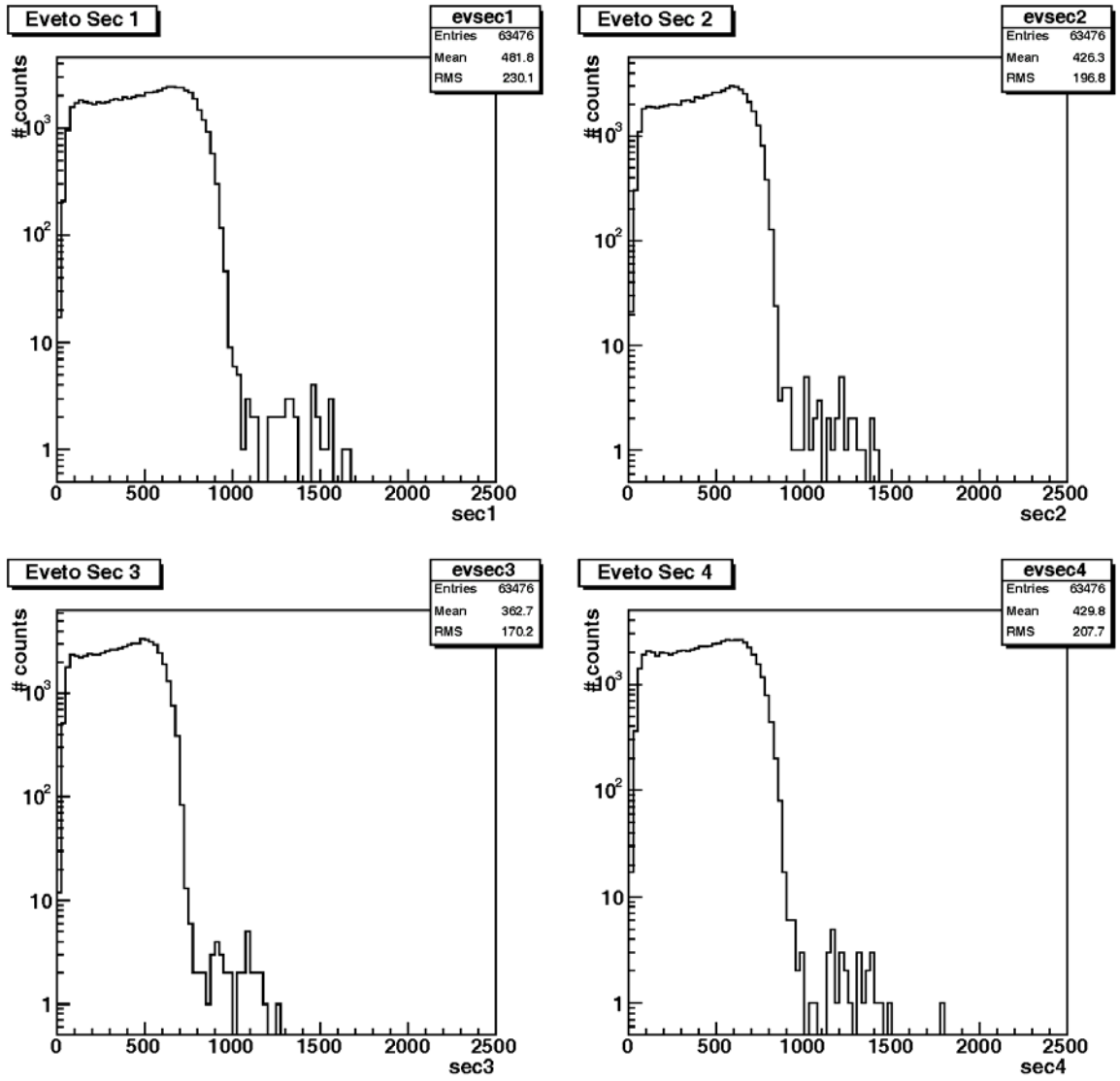

Fig. 1. Distributions of signals from individual Veto Calorimeter phototubes

The centralities for individual phototube was selected by using narrow (25 units) interval in phototube signal distribution placed at various positions of distribution (100, 200, 300, 400, 500, 600, 700 and 800 units respectively).

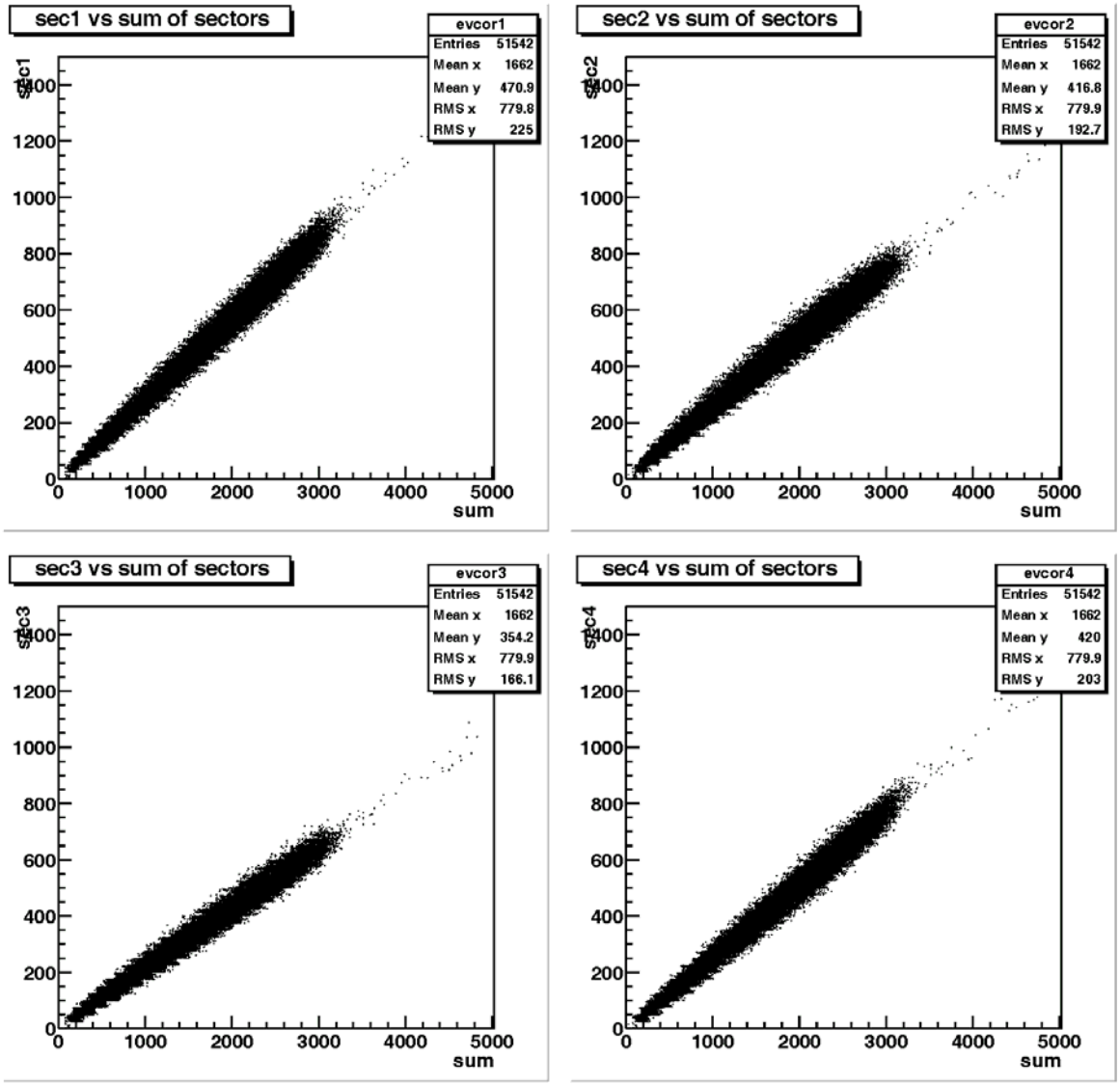

Fig. 2. Correlation between signal from individual Veto Calorimeter phototube and summarical signal of all phototubes

Correction for Veto Calorimeter resolution

(/afs/cern.ch/user/m/mryb/public/multiplicity_fluctuations/coll_meet/collab_april_2003.pdf)

$$\delta' \sim Var(E_V) = \left(2\sqrt{E_V}\right)^2 = 4E_V$$

Effect of single phototube Veto Calorimeter resolution

E_{IND} - signal from single phototube

$$E_V = 4E_{IND}$$

$$\sigma_{IND} = 2\sqrt{E_{IND}}$$

$$\sigma_{IND}^2 = 4E_{IND} = E_V$$

$$Var(4E_{IND}) = 16\sigma_{IND}^2 = 16\langle E_V \rangle$$

Correction for resolution of single phototube of Veto Calorimeter

$$\delta = 4\delta'$$

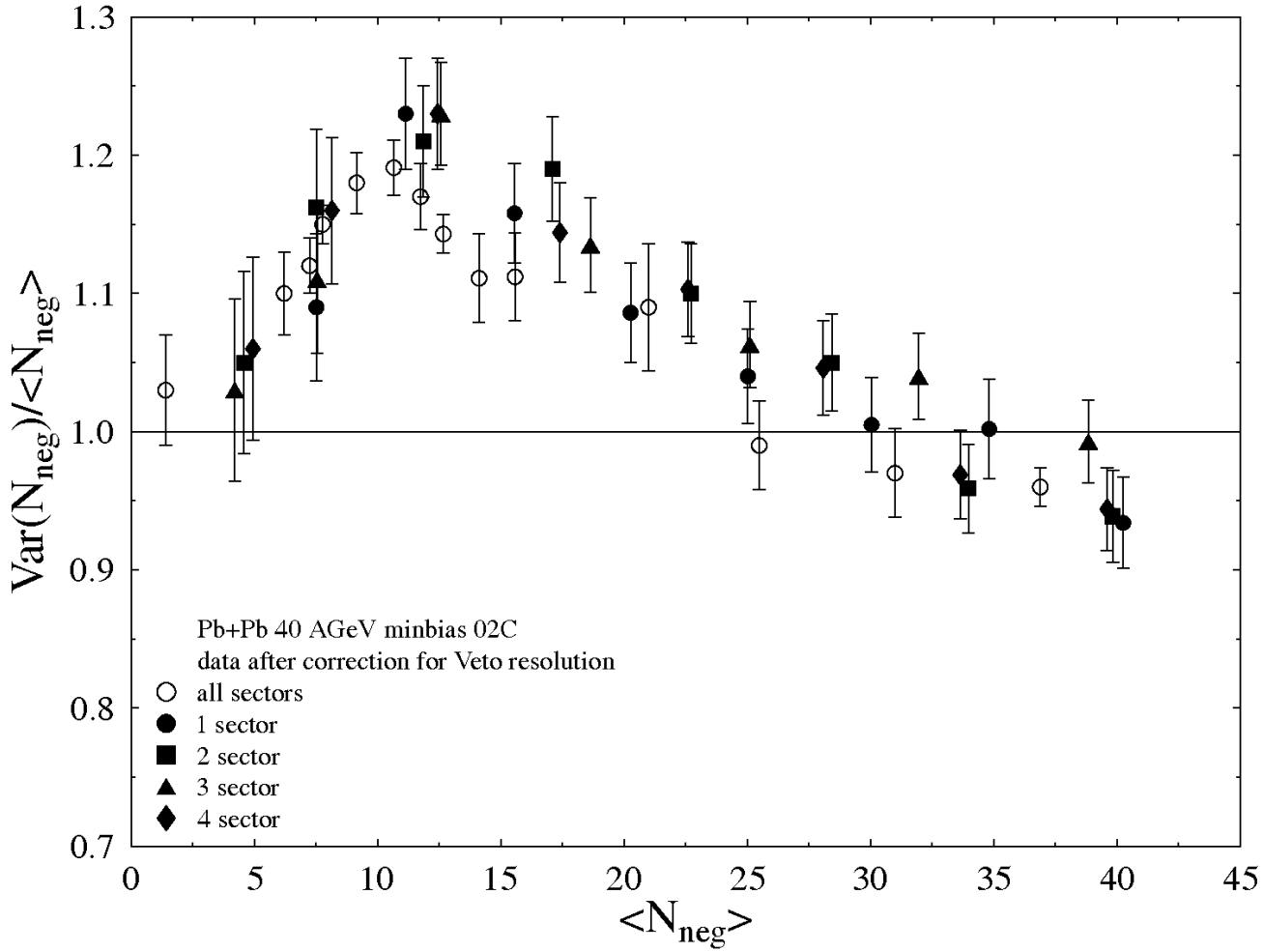

Fig. 3. Normalized variance of multiplicity distribution versus mean multiplicity for negatively charged particles. Data **after** correction for Veto calorimeter resolution. Open circles shows result from all sectors. Black symbols shows the results for individual sectors

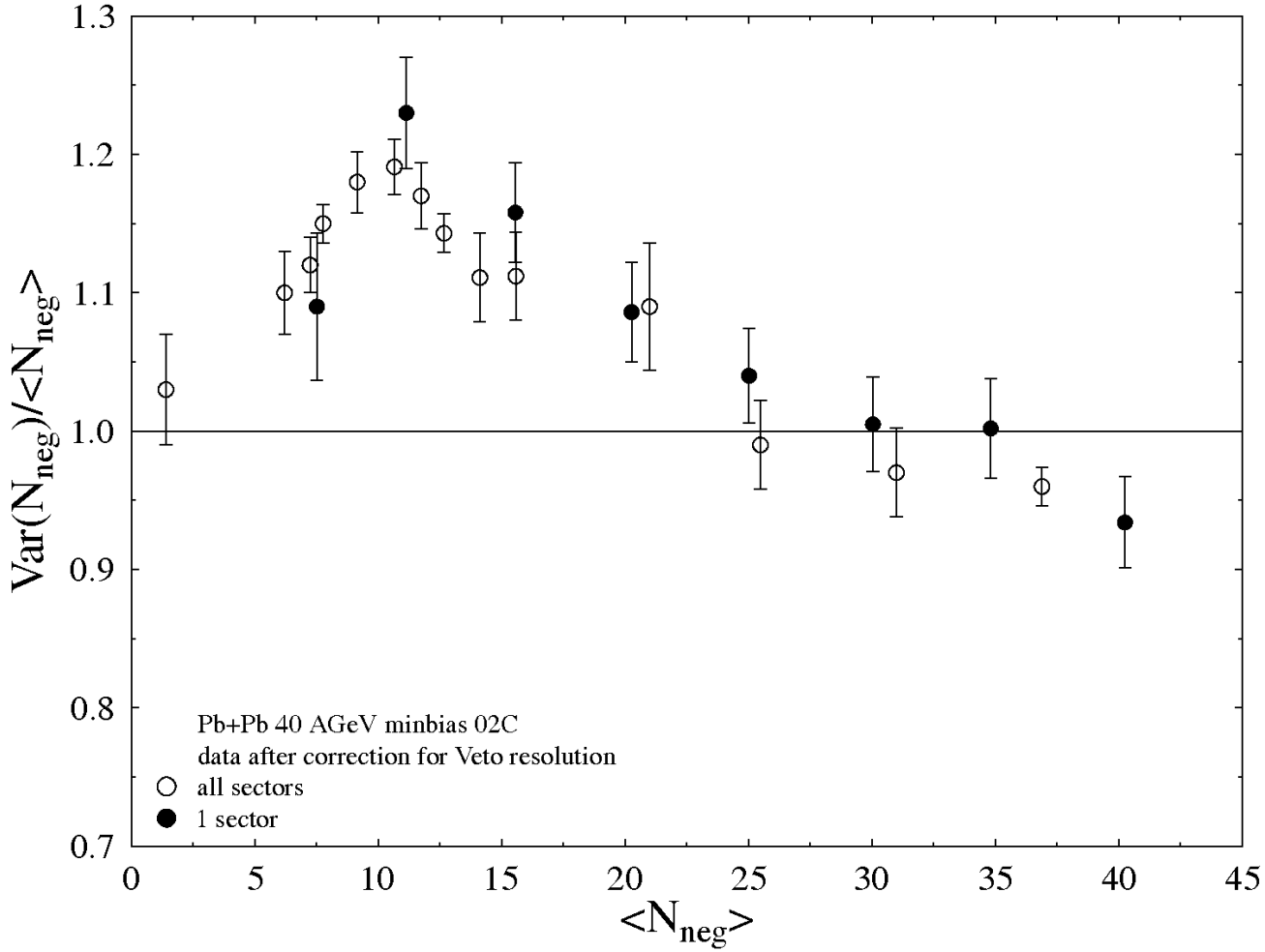

Fig. 4. Normalized variance of multiplicity distribution versus mean multiplicity for negatively charged particles. Data after correction for Veto calorimeter resolution. Open circles shows result from all sectors. Black circles shows the result for sector 1

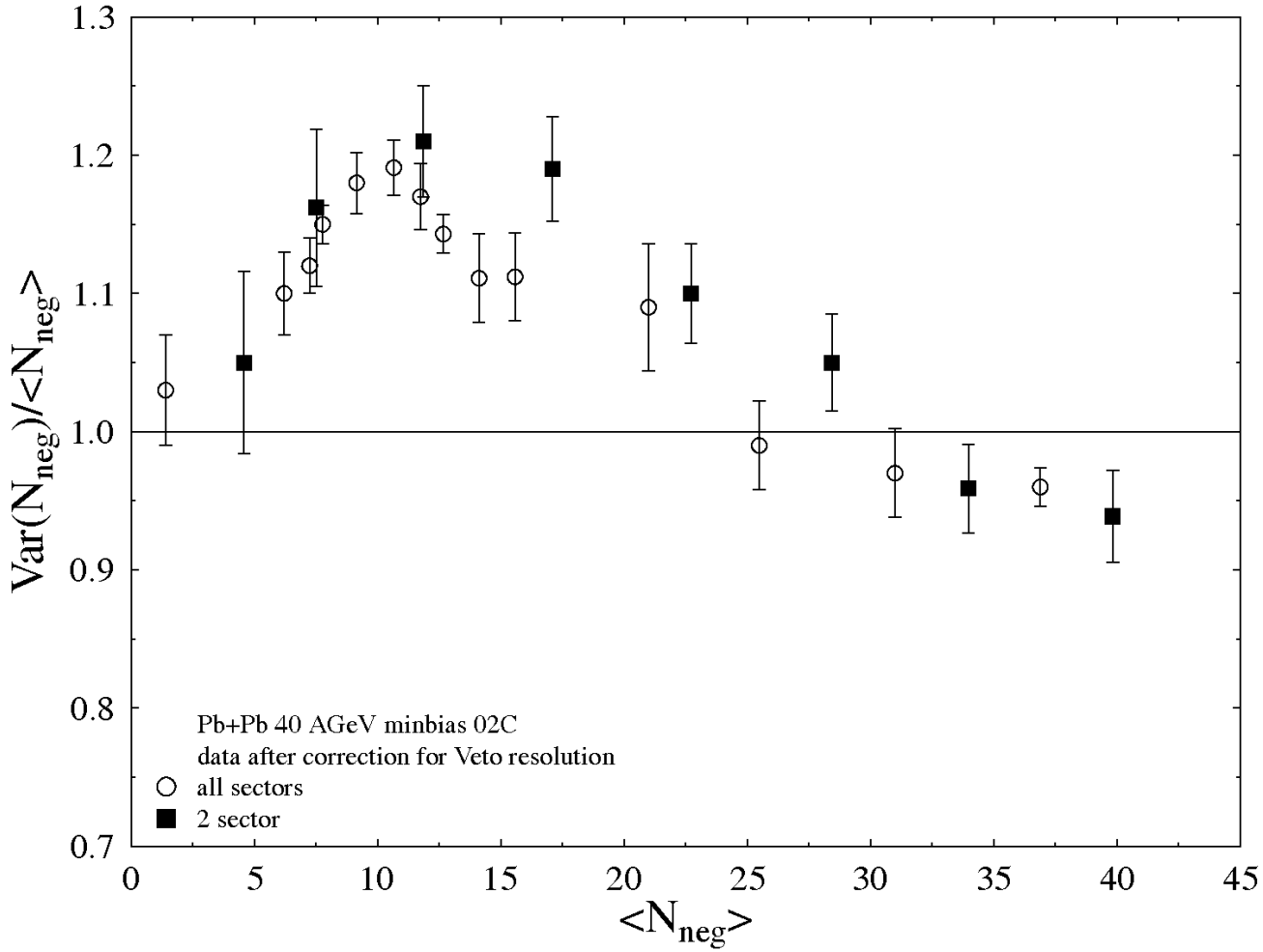

Fig. 5. Normalized variance of multiplicity distribution versus mean multiplicity for negatively charged particles. Data after correction for Veto calorimeter resolution. Open circles shows result from all sectors. Black squares shows the result for sector 2

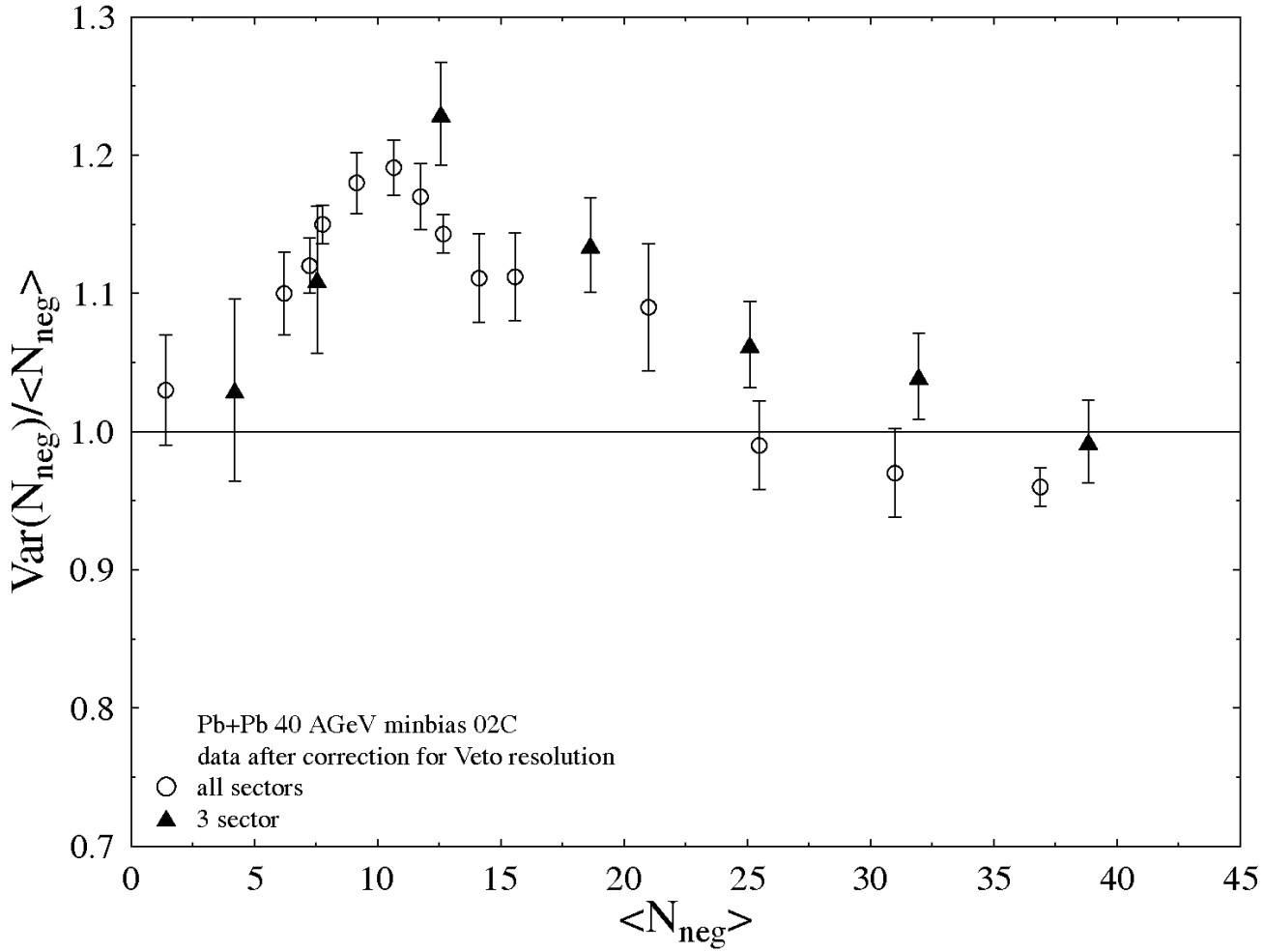

Fig. 6. Normalized variance of multiplicity distribution versus mean multiplicity for negatively charged particles. Data after correction for Veto calorimeter resolution. Open circles shows result from all sectors. Black triangles shows the result for sector 3

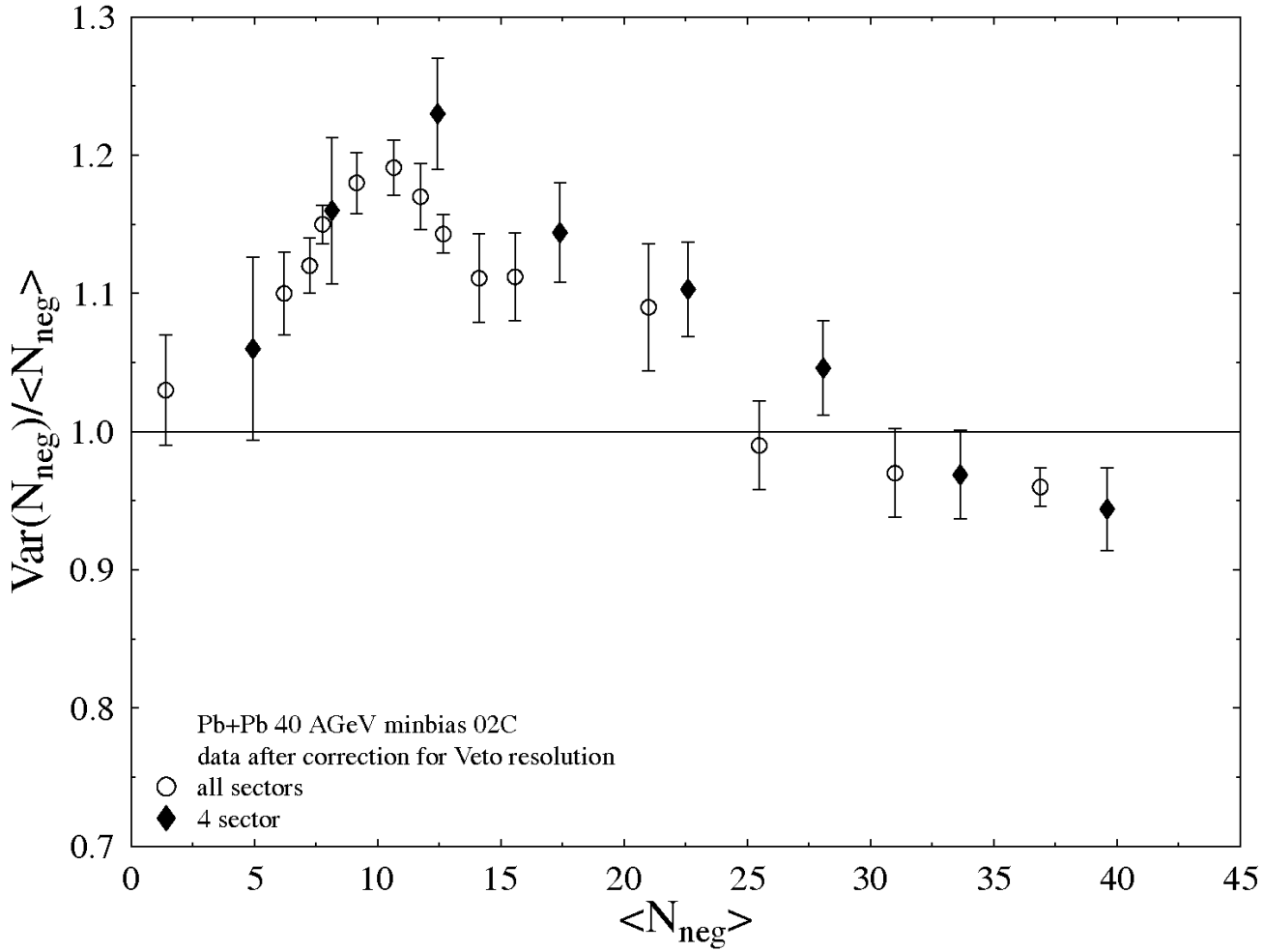

Fig. 7. Normalized variance of multiplicity distribution versus mean multiplicity for negatively charged particles. Data after correction for Veto calorimeter resolution. Open circles shows result from all sectors. Black diamonds shows the result for sector 4

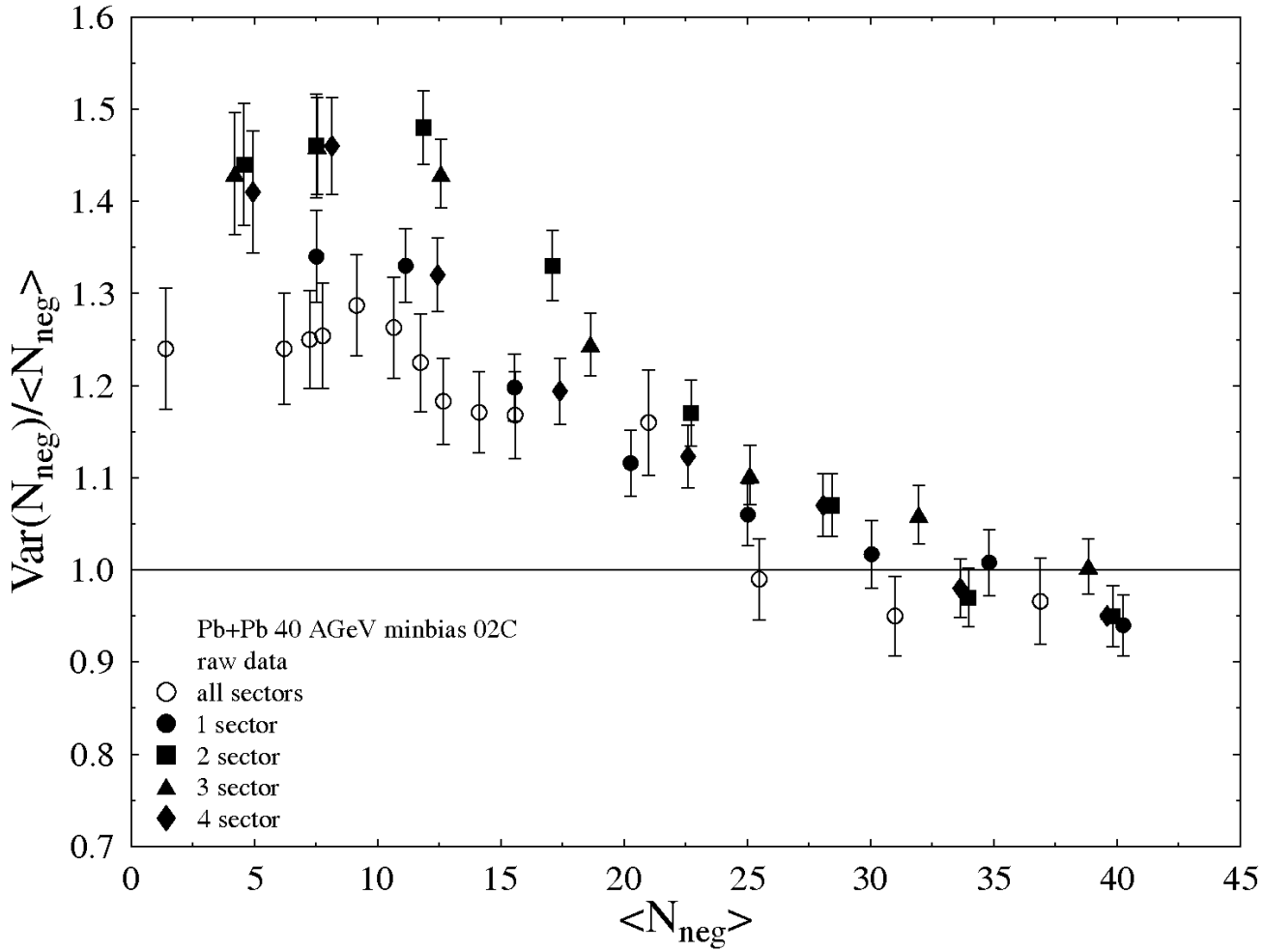

Fig. 8. Normalized variance of multiplicity distribution versus mean multiplicity for negatively charged particles. Data **without** correction for Veto calorimeter resolution. Open circles shows result from all sectors. Black symbols shows the results for individual sectors