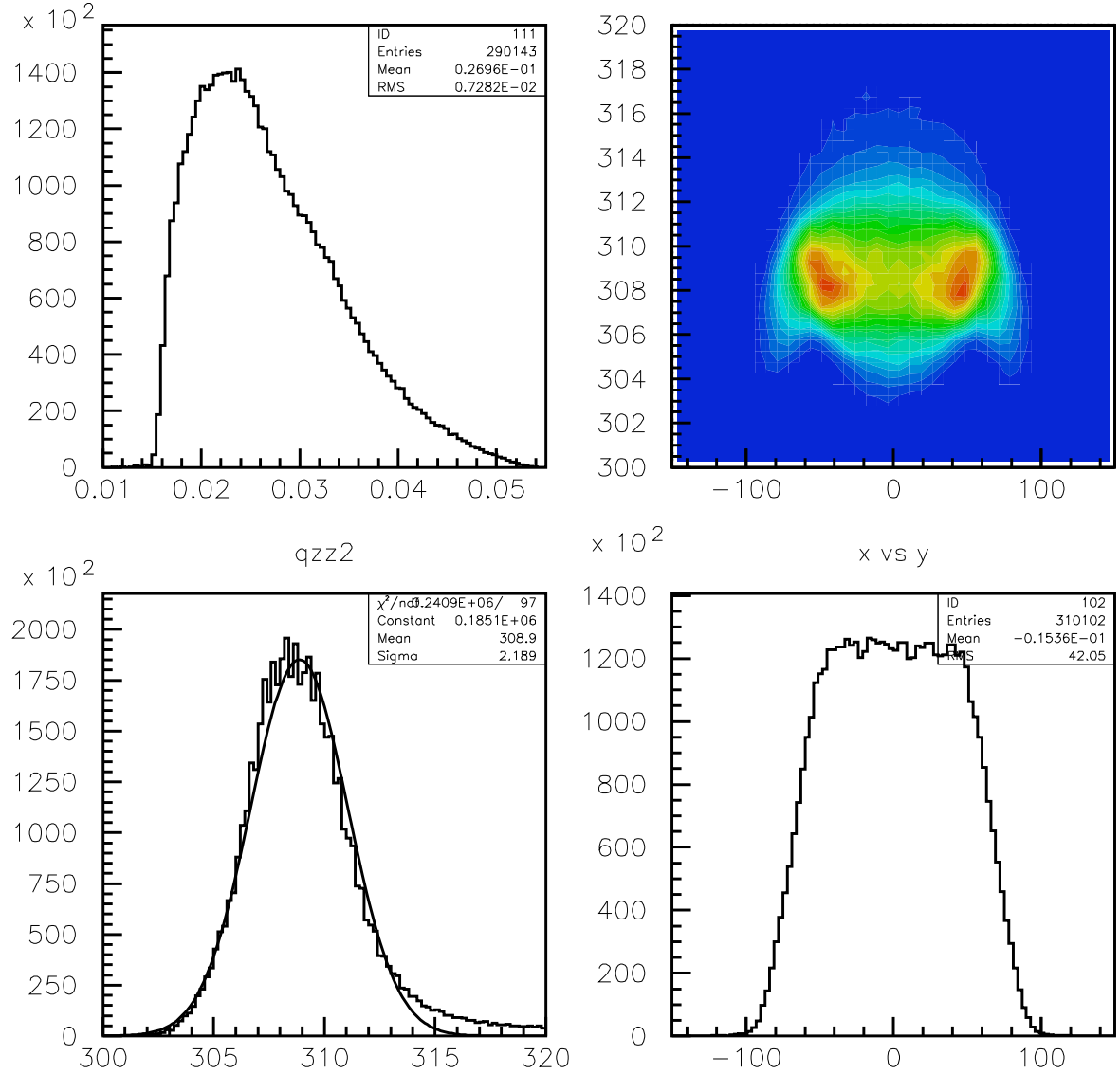
Updates to the Collimator Design, June 2003

Neven has modified the collimator design to limit the length of the image on the Cerenkov bars to 210 cm while maximizing the event rate. This was done by limiting the azimuthal acceptance and extending the Q^2 range to keep the average at 0.028 $(GeV/c)^2$. The following plots show the Q^2 distribution, the moustache and the distribution of events across and along a bar.

The event rate is about 615 MHz/ bar onto an area 15 cm x 210 cm. There is a trade-off between length of image and rate.

Magnet power is 5% above nominal, with bars moved in to z = 530 cm.

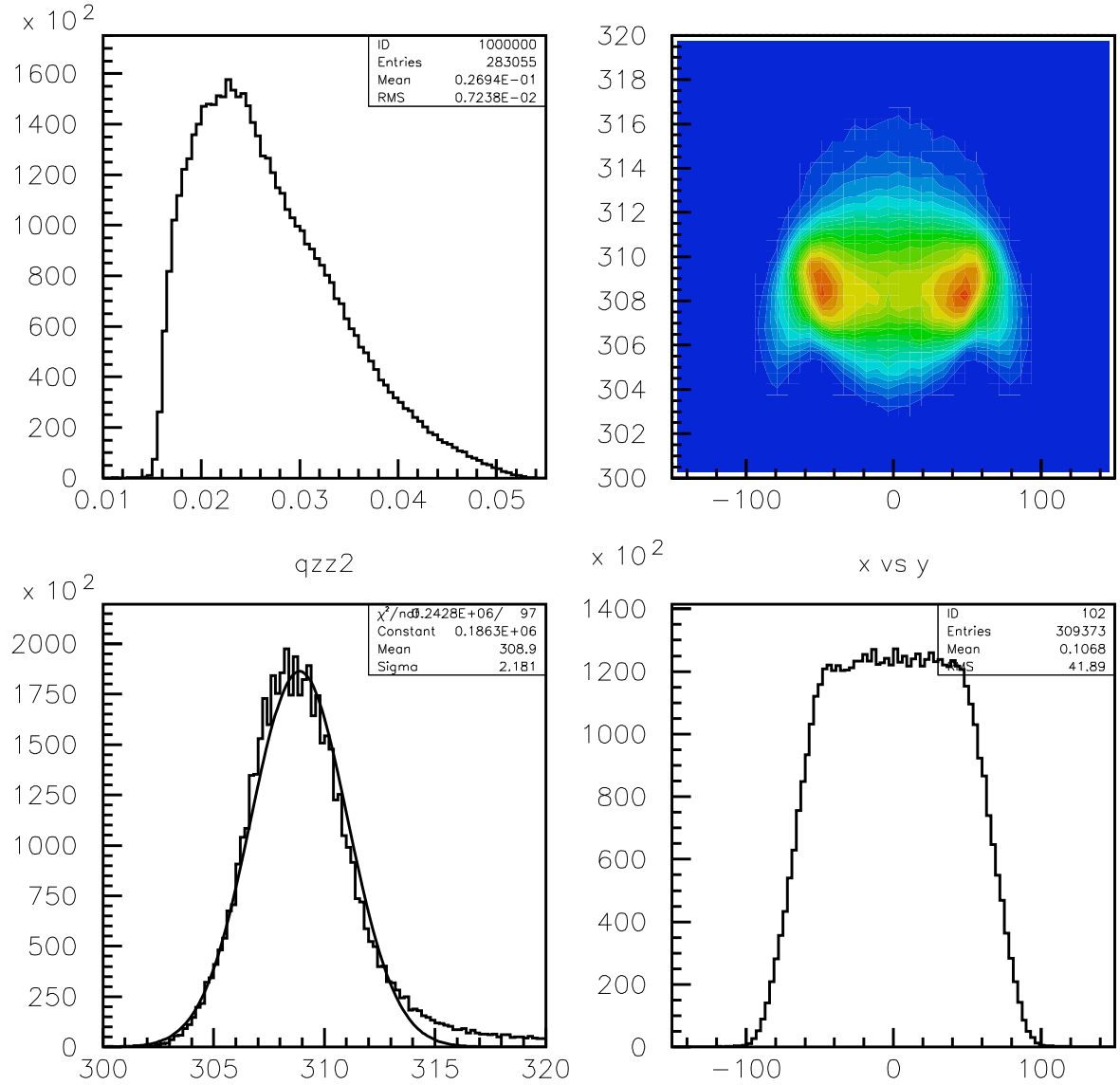
I = 8830 A, z = 530 cm



"Scooped-out" Collimator

To see if the amount of material in the collimator could be reduced, the centre part of collimator 1 was replaced by air, leaving 3" of lead at the up- and downstream ends. The plots here result. They are indistinguishable from those with the full collimator.

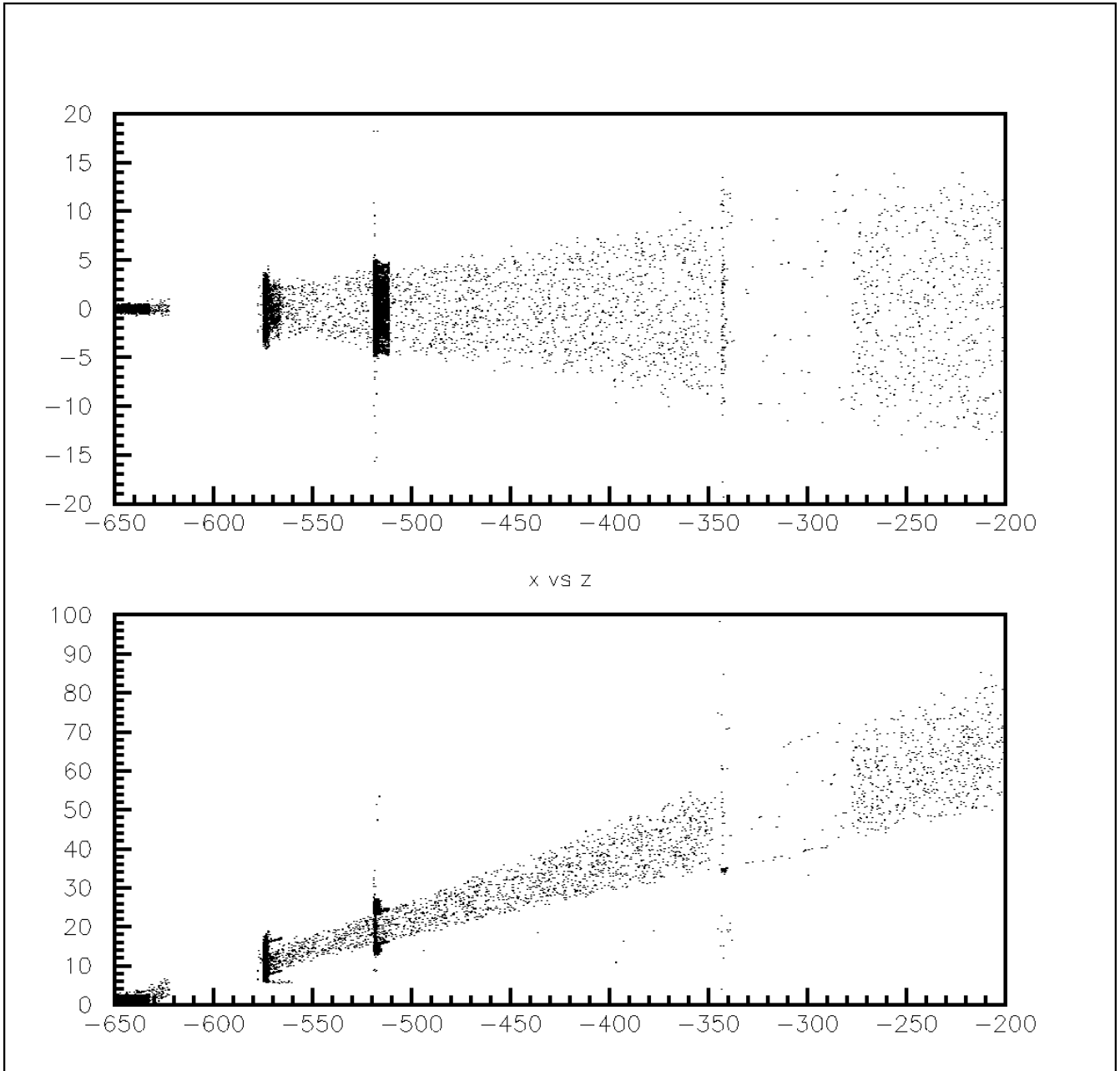
I = 8830 A, z = 530 cm



"Tomographic" plots for scooped-out collimator

These plots show the origin of secondary photons that are generated by primary electrons interacting with the target (at the left, at z=-650 cm), with collimator 1 (between z=-575 and -510 cm) and with air. Collimator 2 is between z=-350 and -275 cm. The plots show where the primary electrons go.

The two parts of collimator 1 are seen. Primary electrons stop generating secondary photons after passing through 3-4 cm of lead. There is no significant generation of secondary photons from inside collimator 2, so the primary electrons are not striking the walls.



Images on the Cerenkov Bars