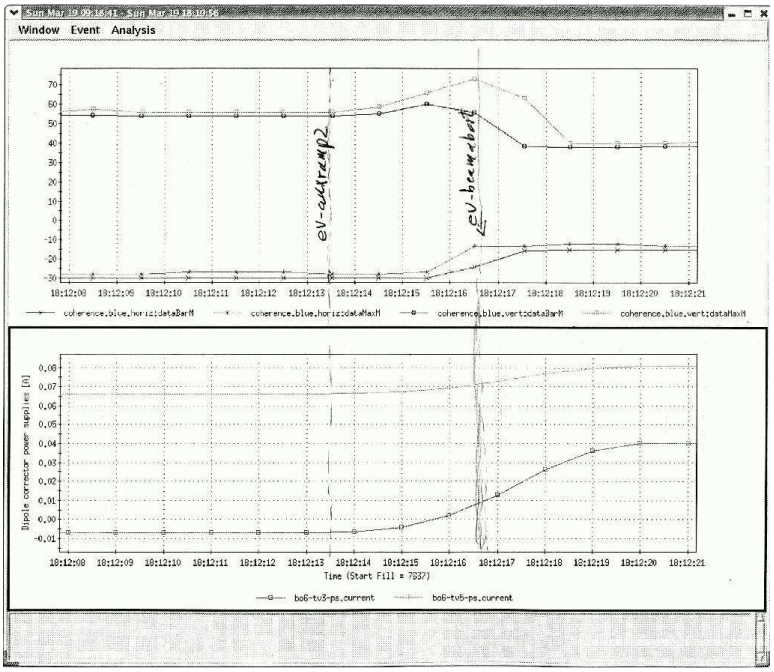
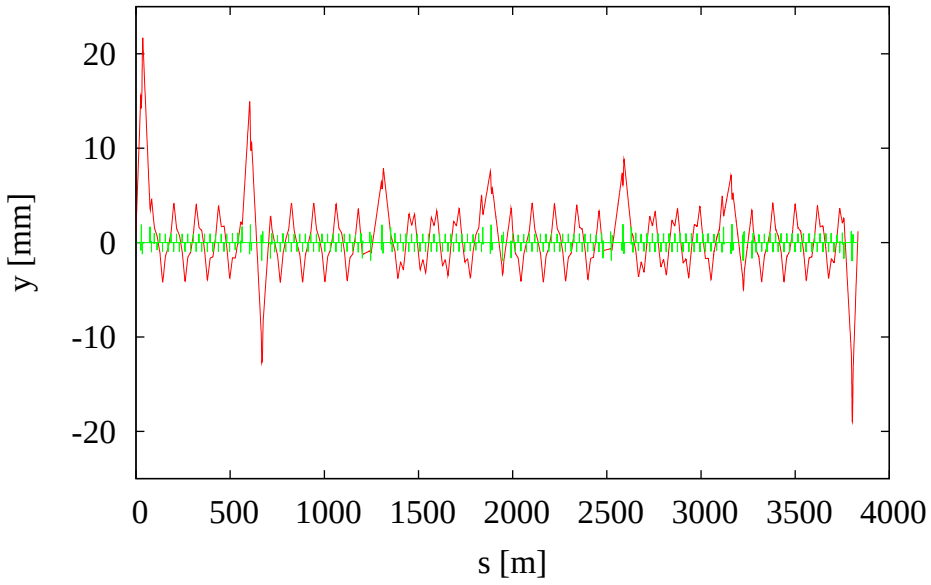
Beam loss 19 March, 2006 at 6:12 pm

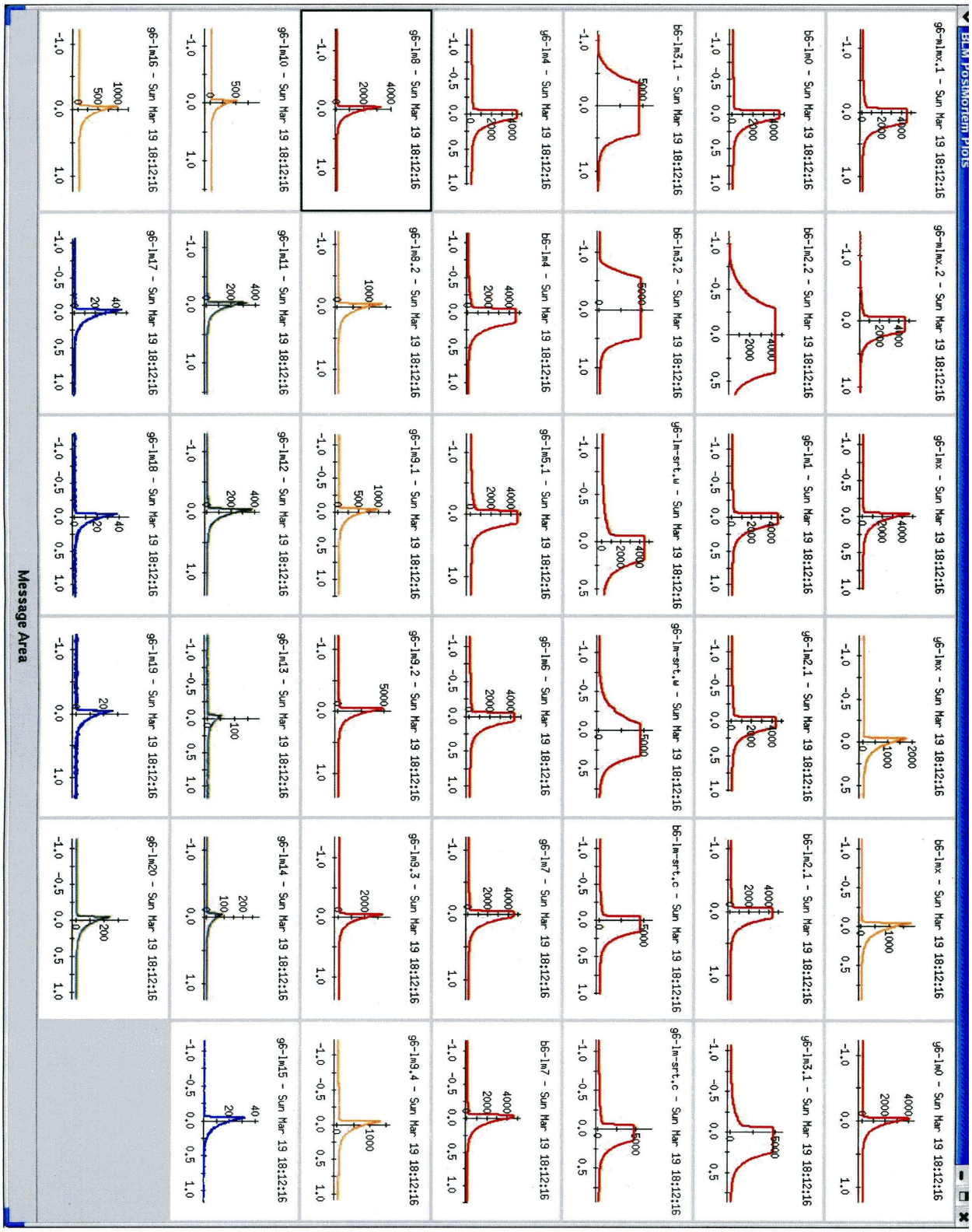
It appears that the beam loss occurred because the vertical separation bumps were ramped at the end of the store to prepare for the next ramp, but the corrector power supply for "bo7-tv3" did not ramp. The lower plot of the first figure shows similar correctors for the STAR bump ramping; note the ramp started about 3 seconds before the abort and reached about one third of the total 3mm amplitude. This produced an unclosed bump. A simulation of the closed orbit errors with the separation bumps with the missing corrector is shown in the second figure; note the peak amplitude occurs at the STAR triplet on the west side in Q3 of that triplet. With the orbit errors, there were probably tune shifts and changes in chromaticity which could account for the increased coherence logged in the top of the first figure.



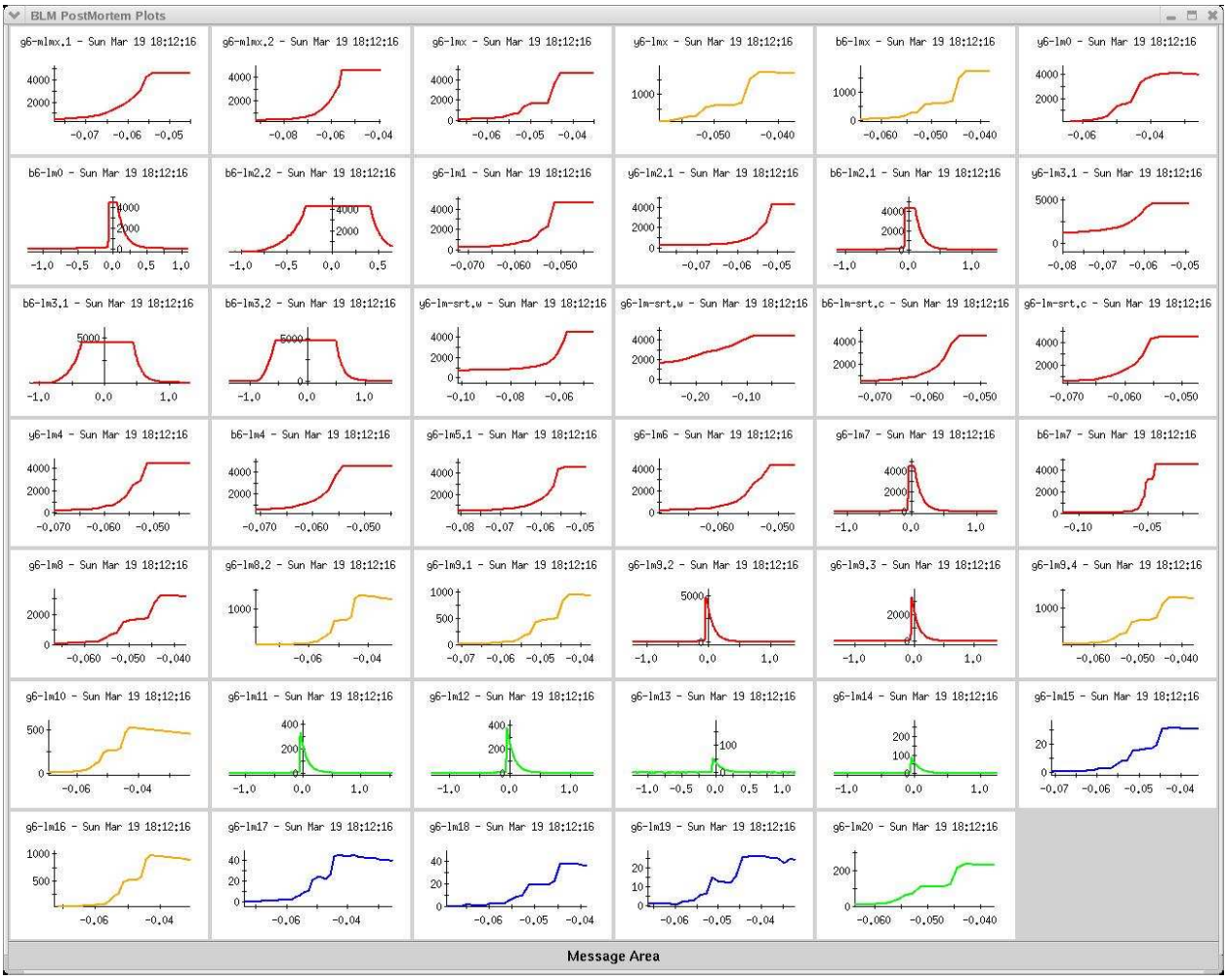
Estimated closed orbit for blue beam abort 19 Mar., 2006 18:12



The logged losses in sectors 6 and 7 show that the first significant losses occurred in the 6 o'clock triplet about 800 ms before the abort. It is worth noting that even though the b6-lm3.1 saturates very early, the loss monitor on the other side of the yellow Q3 shows an attenuated rise with a big fast loss much later.



This figure shows the same loss monitors as the previous figure, but many of the plots have been zoomed in around the rise of losses.



Looking at the rise in losses at other locations around the ring, it becomes obvious that at least 20% of the beam was initially lost in the vicinity of the 6 o'clock triplet, since the "y6-lm3.1" signal saturated before the first significant beam loss, and loss monitors at other locations rose after the first 20% of the beam was lost. Considering the orbit excursion and saturated losses at the 6 o'clock triplet, I would guess that most of the beam was lost in this vicinity, but the evidence is that at least 20% was lost there. The total amount of beam which was in the blue ring before the losses was 8×10^{12} protons.