Fitting energies with a centre-of-bend constraint

Following up from triplet studies in individual arms, have now fitted relative gains *between arms*:

- Fit angles in each arms individually (a la Eric & John)
- Calculate angle *changes* between energy points...
- ... and thus calculate energy changes w.r.t. NMRs

For 13 fills analysed so far this gives result which are by eye consistent with previous analyses. Triplet shifts mean that there is a significant different in energy, depending on which BPMs are used. But there is a very clear systematic dependence (already seen by Bernd):

Inner BPM combinations give higher energy, outer BPM combinations give lower energy!

Can we tell which comb.s are correct (or more correct)?

Try a different fit method: fit simulaneously (change in) beam offset, angle and bend angle, with centre of magnet as constraint . Then assess consistency of all BPMs.

$\longrightarrow$ Very preliminary results

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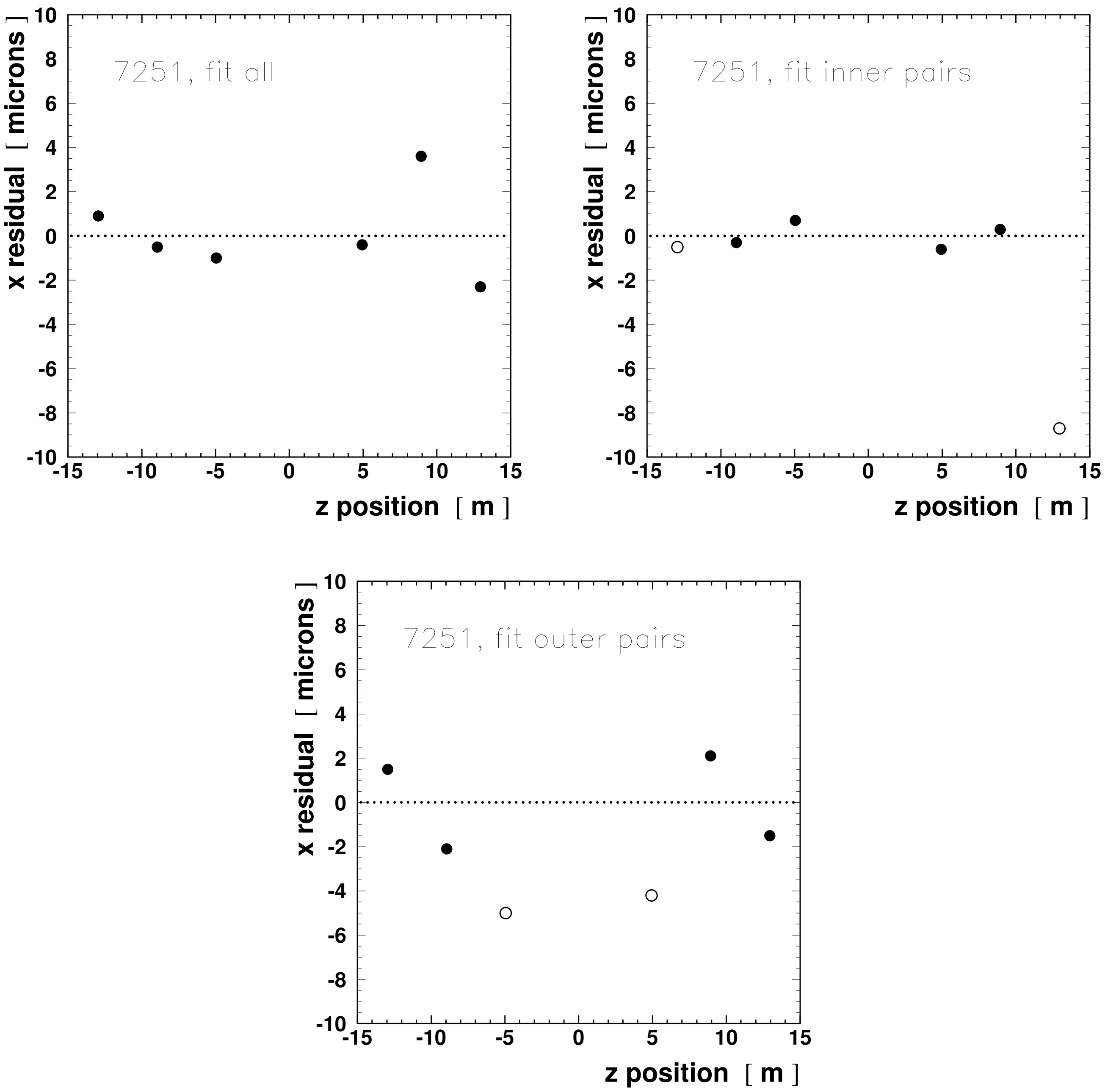
16/11/01

Very clear cut example

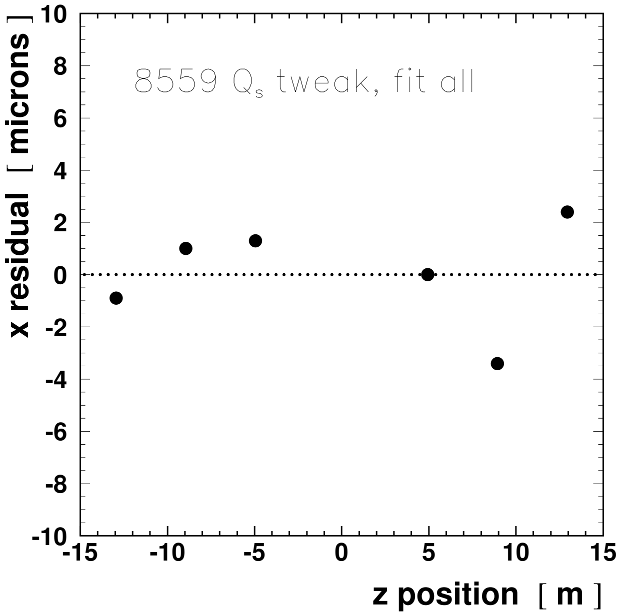
Fill 7251 high energy, big triplet shift on one side

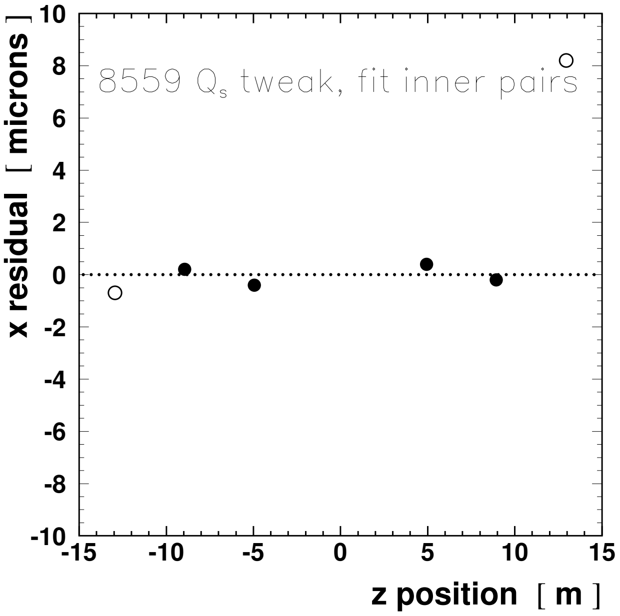


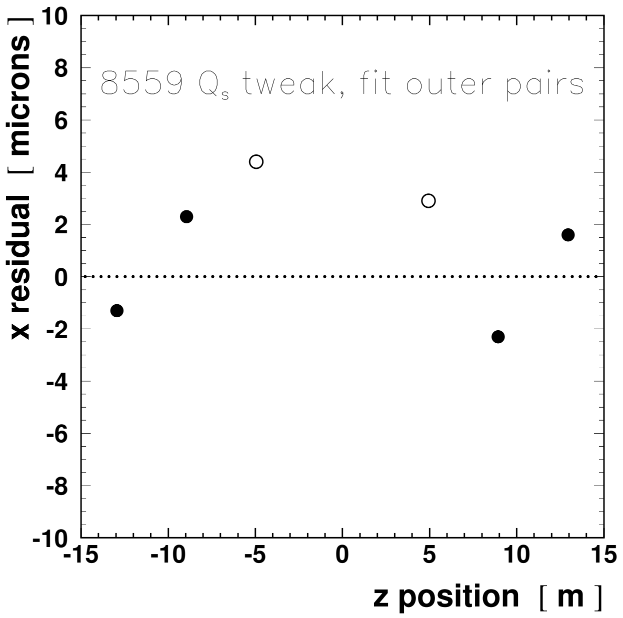
One BPM is clearly inconsistent with the other 5

And another one

Fill 8559 50 GeV Q_s tweak (snake that swallowed an elephant)



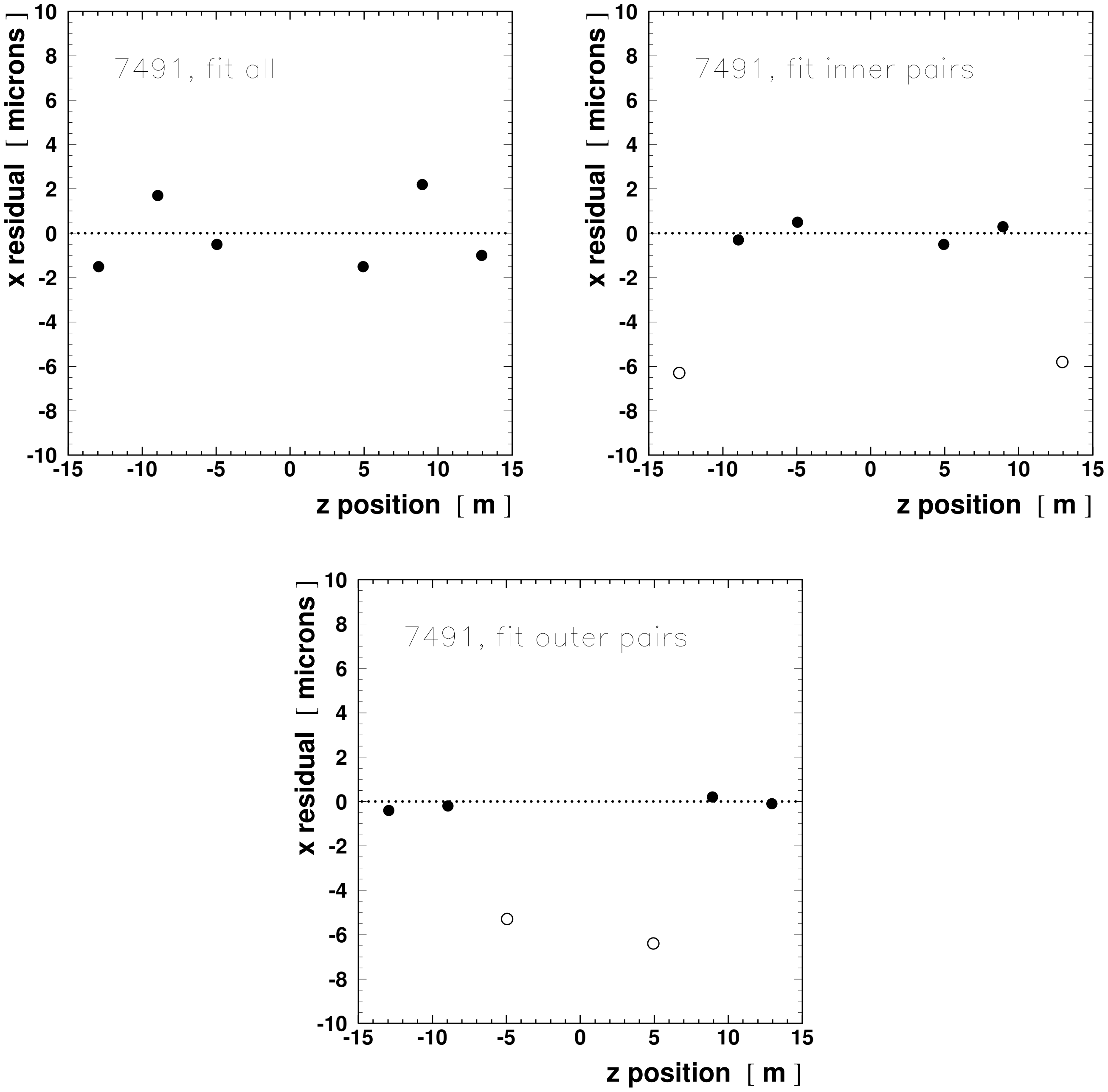




Again one BPM is picked out (also seen by eye in raw data)

Generally otherwise

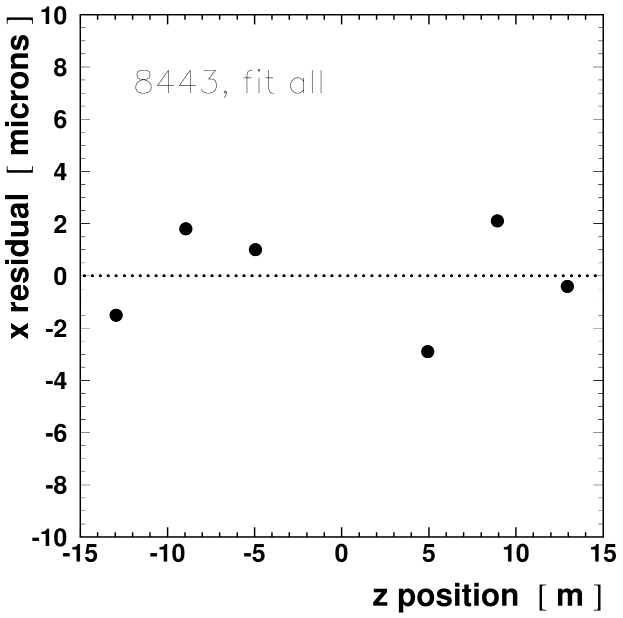
In fill 7491 both inner & outer fits are acceptable

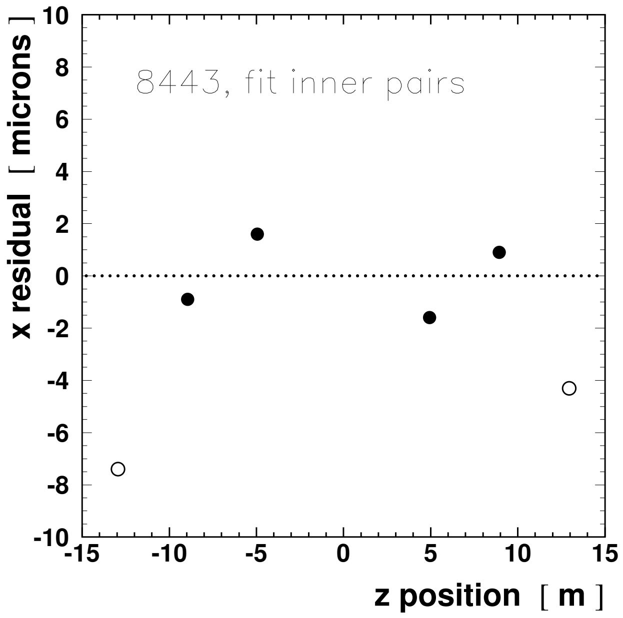


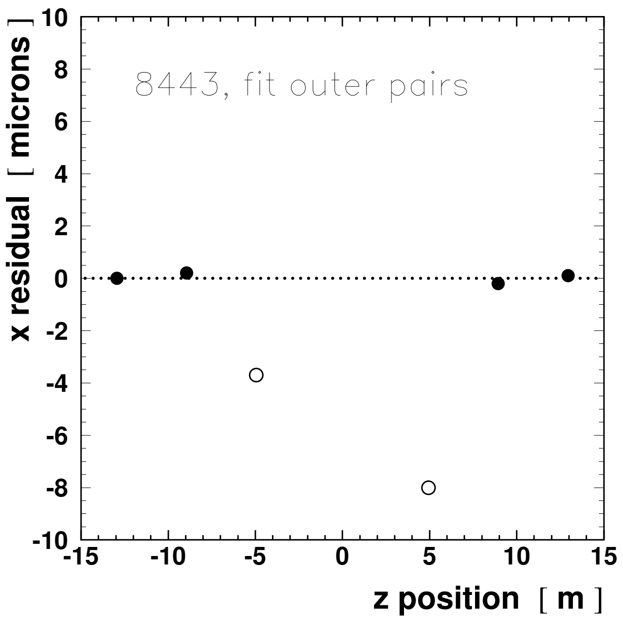
Most fills like this: symmetric triplet shifts on both sides

Annoying counter-examples

In fill 8443 it is the outer BPMs which are favoured!







Conclusions & plans

Fit with centre-of-bend constraint works, and is promising method to identify bad BPM(s):

- Refine fit (& add ambient field correction) and iterate over all data
- Use same method to study drifts at fixed energies
- Also look at behaviour in y