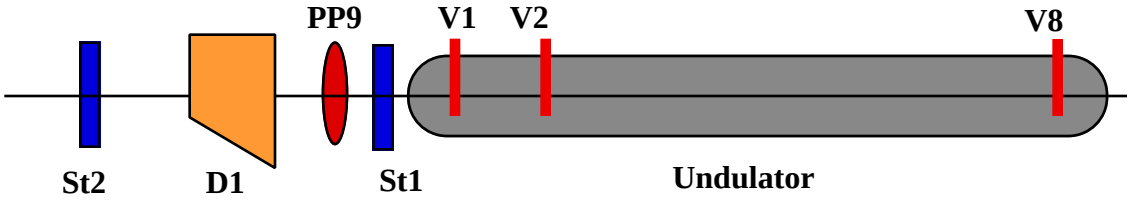
Alex Murokh

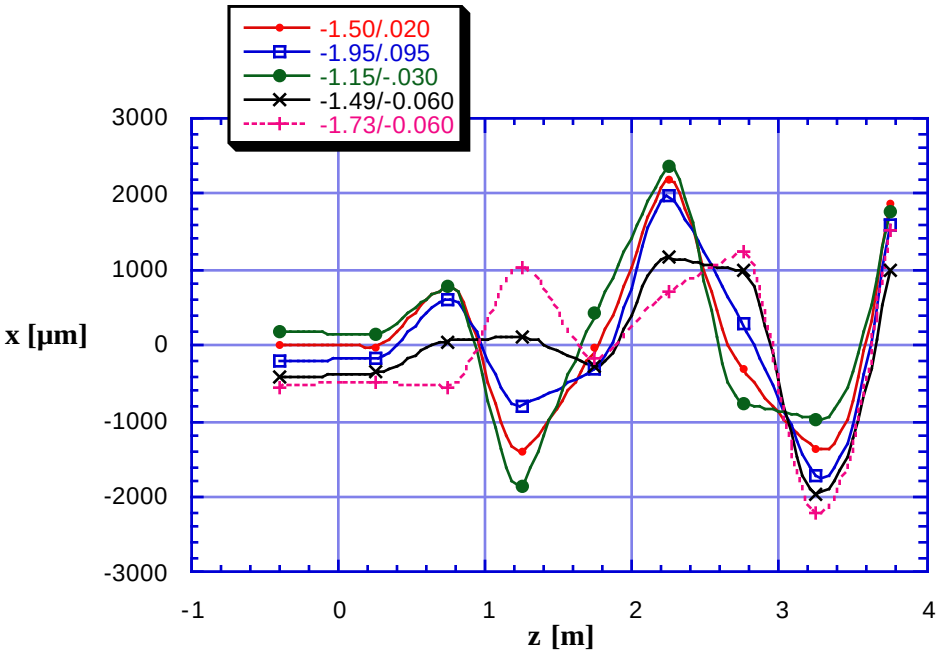
Trajectory studies on 6/13/00

Note the changes in the focusing scheme:

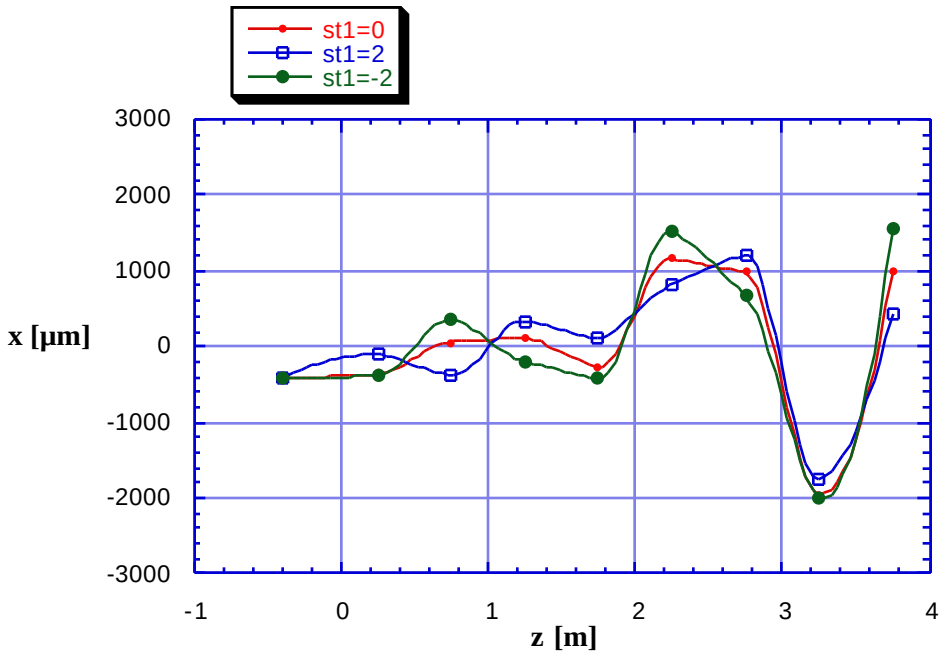


In addition to trim-magnets St1 and St2, the dipole D1 was used to better control the beam entrance conditions.

First, we turned off trim St1, and used pair of magnets St2 and D1, and pair of BPMs (PP9 and V1), to displace the beam parallel to the alignment laser, and find the best entrance condition:

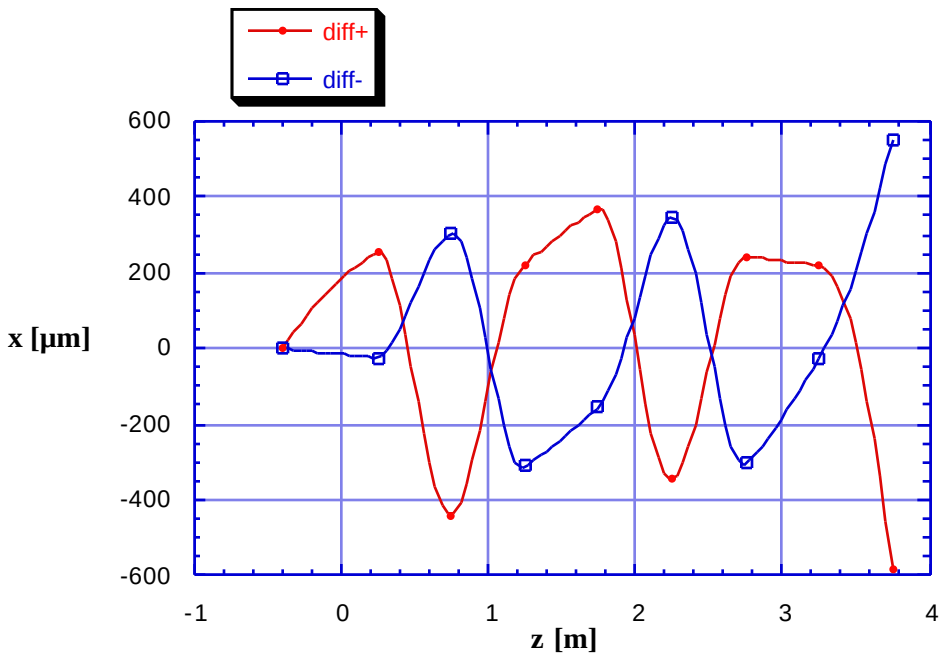


The trajectories are marked by the current through St2 and D1 respectfully. The best trajectory is (-1.49/-0.60). We set these current settings, and varied St1:



The trajectory is closest to the straight line along the first 2 meters of the undulator for St1 = 0.

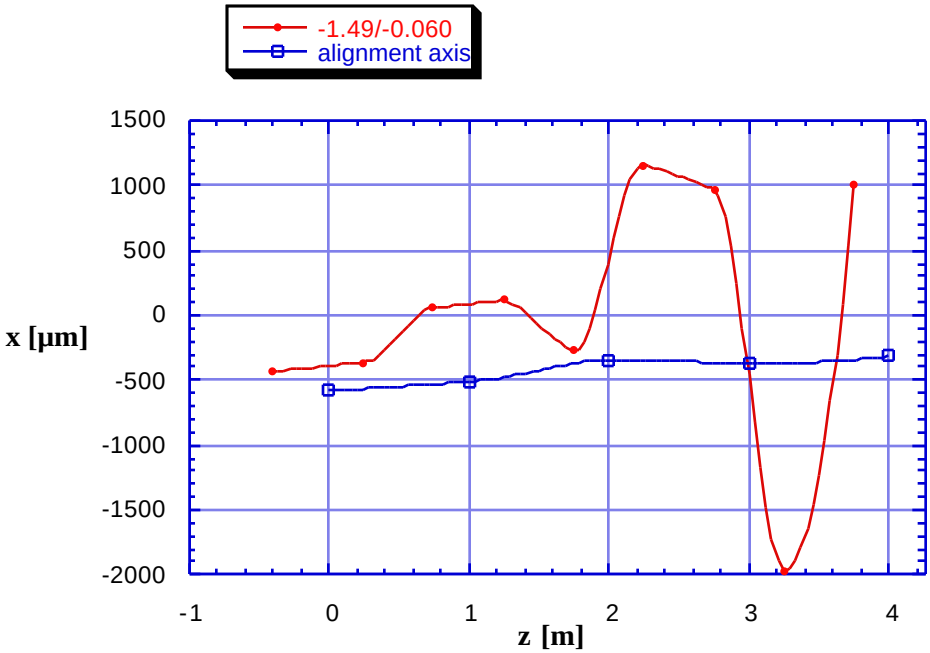
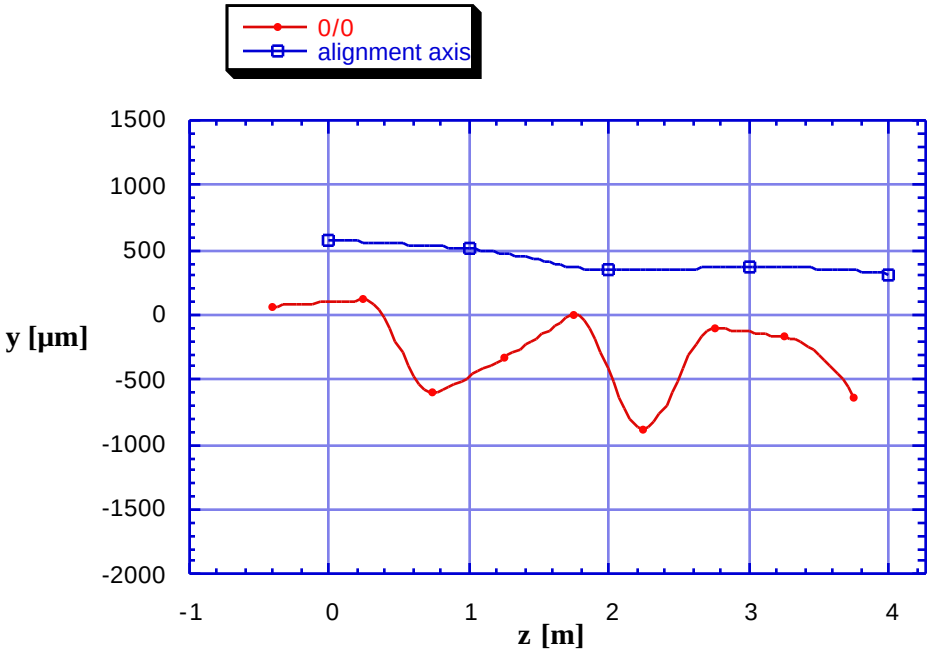
Looking at the differentials, one can observe certain asymmetry up to 200 µm:



There are two sources of errors, which can randomly add or cancel each other for each measured data-point:

- As we were not very concerned about the shape of the beam, centeroid determination could have ambiguities on the order of 50-100 microns (~ 5-6 pixels).
- To compensate for the RF phase drift we frequently readjust attenuation in the linac, to ensure that the beam is going through the narrow high energy slit. Yet, the procedure allows fluctuations of the beam transverse position at the exit of the dispersion section on the level of fraction of the slit width (easily an order of 100 µm).

The “best” measured trajectory can be compared to the presumed alignment settings:



Briefly the measurements were repeated in y-direction: