Paul Trap Collaboration Meeting 22/6/2017

Attended:
H. Okamoto, K. Ito et al., Hiroshima University
S. Machida, D. Kelliher, RAL/STFC/ISIS
S. Sheehy, L. Martin, Oxford University

Minutes:

1. Update from Hiromi Okamoto:

Circulated images of the new non-linear trap. It looks very nice! The electrodes are now coated in gold to improve performance. The Non-linear trap is constructed and ready to be installed in the vacuum vessel. Whenever a new trap is installed, it is always necessary to adjust voltages and phases. During her visit, Lucy will learn how to do this. (Obviously, cannot guarantee that the new trap will work straight away during Lucy's visit.)

We will use SPOD-1 or SPOD-II to do C_m measurement
Action: Suzie to circulate document outlining measurement in more detail

Hiromi will discuss schedule with Ito-san and update us next week on the order of experiments likely to be possible during Lucy's stay.

2. Update on beta measurement from Lucy Martin:

- Gave a short update on the beta function measurement, taking into account the limitation of a 10V pulse.
- She has looked at a measurement suggested by Shinji to use a limited number of repeated kicks. The limitation is that the timing of the repeated kicks on phase. Lucy assumes 120ns and 10V pulse height, 1 pulse in 1 FODO period.
- Is burst mode possible using AWG? Ito-san says we can try it for an arbitrary number.
- There is some uncertainty over the accuracy of the phase of applied pulse, and then the accuracy of the repeated pulse position as well.
- The question is how accurately we can measure the beta function based on the limitations of the system?
- We will probably use sinusoidal focusing in SPOD-III rather than step focusing to do this measurement. So we should assume that (but the beta function is very similar between the two).
- Hopefully, the Hiroshima team can teach Lucy how to use WARP to model Paul trap

3. IBEX update (verbal) from Suzie Sheehy:

Gave a quick update on IBEX. The vessel is currently open, we have fixed a lot of the issues that we were having with noise etc… and will do some in-air testing of electronics before closing up again. Workshop is machining a new FC cover with a grid to further reduce noise. The prototype board from Adam is in progress. This will undergo testing with waveforms in the next few weeks.

4. Presentation from David Kelliher:

Octupole Strength Comparison. He considers the Hamiltonian including the new non-linear

‘octupole’ rods. Then considered the quasi-integrable optics case. Came up with an expression for V_oct the octuple strength required. The octuple strength applied voltage of 0.2V seems quite low, so David asked for a check of the maths. (After meeting: solved, due to Argon vs Proton mass error in calculation)

5. Discussion:

Comments on IOTA. How can matching be achieved (in the real machine as well as in our simulations or Paul trap experiments)?

6. Next meeting: to be arranged during Lucy’s visit to Hiroshima