KURRI FFAG MEETING 15/10/2015
Google+ hangout meeting

Attendees:
C Prior, C Rogers, D Kelliher, S Machida, S Sheehy - RAL & Oxford
M Haj Tahar, F Meot - BNL
Y Ishi, T Uesugi, - KURRI

Minutes:

1. Ishi-san gave an update on the machine status.
   - Damaged RFQ has probably 4 leaks but the vacuum level is not too bad at around 10^-5 torr. They will attempt to seal what are assumed to be small leaks with UHV sealant.
   - The inside has been cleaned with water/ethanol.
   - Earliest possible date it would be back on if this works is probably end January. (But in what condition, not sure yet!)
2. Malek gave a comparison of single particle tracking results between ZGOUBI and SCODE.
   - Transverse already in good agreement from previous work.
   - First looked at fixed RF frequency longitudinal phase space – the two look very similar.
   - Including RF pattern with variable frequency there was some discrepancy. This probably arises from the initial conditions.

The OPAL work is progressing thanks to Andreas & Chris R. The RF model has been pushed to GitHub and will be tested soon. Then will be able to add this to comparison.

3. Shinji presented work on simulation using the KURRI-FFAG as a model in SCODE.
   - After doing single particle tracking, he has started looking at multi-particle tracking.
   - Step 1 was without space charge. Looked at initial beam matching.
   - Step 2 was with space charge.
   - Longitudinal matching – usually with S.C. the matching only changes a little but this is not true for short bunches. In the future a more detailed matching procedure may be required.
   - 6D waterbag distribution made.
   - There was a slight initial increase in horizontal emittance in the non-space charge case, Malek observes something similar. They will compare info…
   - Longitudinal space charge is probably overly high as he used a short bunch. So may be worse than in real case.
   - In the space charge case he presented some nice results on emittance growth, tune spread etc…
   - There is a step-wise increase in emittance observed with half synchrotron period, which is explained by a strong coherent

quadrupole oscillation in the longitudinal phase space causing growth in transverse phase space. Additional matching should help this.

- Will be interesting to see how the codes converge with S.C!

Questions/items to look at:

ZGOUBI is s-dependent tracking. Need to think about how this compares to t-dependent tracking in SCODE and OPAL.

It is difficult to simulate a long bunch in an h=1 machine. It is 'banana-shaped'.

Look at the amplitude dependent tune shift within the realistic aperture.

KURRI FFAG's chromaticity is not exactly zero. Is there any chromatic effect on emittance evolution through resonance crossing, for example?

At this stage a finer-grained field map is required. Follow up with Mori-san (was an action item of last meeting).

4. We had a short discussion of the referee comments on the paper. Suzie will follow up with Shinji and David and contact others directly if required (most of it looks like it should be fine for us to do.)

5. Next meeting: in January. Suzie will send out a doodle poll again as it worked well this time.