Questions for 4th ICFA Mini-Workshop at CERN 4th – 6th of November 2019

General Issues I (LINACs & Noise)

1. SC Issues at LINACs

- **Critical Issue: Space Charge Neutralization and Rise Time: phenomenon noticeable at low energy, the time for the build-up of the neutralization is measured on the beam pulse. Effect of fast switching elements on the neutralization.**
- **Less critical but discussion starter: Beam Matching: at 45 KeV and 3 MeV, change of transverse phase advance to accommodate diagnostics, effects on emittance and beam losses.**

2. Noise Issues with SC Codes

- **PIC codes are suffering intrinsically from Grid Noise. How bad is that really?**
- **In the Frozen, but Adaptive mode, Noise has also been seen caused by the renormalization of the Beam Sigmas. Remedies other than more macro particles?**

3. Symplectic PIC Solvers – Progress and Outlook

- **Will this solve the Noise Issue or only part of it?**
- **What is the progress presently?**
- **What is the penalty in terms of speed?**

General Issues II

1. **SC Compensation**

   Recent developments, feasibility
2. **Beam loss in simulations**
3. **Interplay of space charge with other Effects**

   E.G. IBS, electron cooling
4. **Coherent vs Incoherent**

   regimes, limiting cases
5. **Emittance measurements for beams with large dispersive contribution**

   Experience, de-convolution

SC issues at other accelerators than at CERN

- **Space charge or multipole error driven resonances**

  How to distinguish experimentally?
- **Limits of resonance compensation with space charge**
  - **Limited by tune spread itself?**
  - **Experimental experience?**
- **Importance of non-linear model**

  Remnant fields?
- **Modeling and experimental experience with intrinsic power converter ripple, synchrotron motion and real noise**

  In other accelerators that at CERN?
- **H- injection chicane experience**

  Operational experience close to half-integer (eddy current induced beta-beating)