Weekly Meeting Presentation

Joshua Yoskowitz

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Meeting Topics

- Continuing ion trap simulations using GPT
- Using a BPM to determine ion species in the accelerator (see Research Notes and Documents)
- USPAS
- IPAC 2019 - Melbourne, Australia - Dates: 5/19/19-5/24/19. Registration is 10/1/18-3/1/19 (Early bird registration)
- Other topics/ideas for the future?
  - Measuring the wavelengths/frequencies of light emission due to ionization: can/should we measure this light to determine the types of ions in the beamline?
  - Ramsey Interferometry (Matt)
  - Charged Dust (Joe)

GPT Ion Trap Optimization

Steps to determine the conditions for ions to be trapped between the biased anode and magnetizing solenoid

1. Create accurate model of GTS including field maps of E-field for cathode-anode gap (from Gabriel) and B-field for magnetizing solenoid
2. Determine tunable parameters for optimization using the magnetic mirror condition:

   $$\sin^2\theta < \frac{B_0}{B_{max}}$$

   Probably need to tune: kinetic energy of ion, longitudinal and transverse momentum of ion, strengths of E-Field and B-field from anode and solenoid
3. Use GPT to solve for the optimal parameters for trapped ions and determine the lifetime of trapped ions - using GDFSOLVE to scan parameters as in tutorial 2.4.
4. Compare with Mamun's run during Labor Day weekend and/or initial observations in mid-August.