RAMYA BHASKAR
MENTOR: RICCARDO DE MARIA

IMPLEMENTATION OF ADDITIONAL MAPS IN SIXTRACK 6D TRACKING CODE

PERSONAL SUMMARY

- Double Major in Physics and Computer Science & Engineering at University of California, Davis

- Most experience is in computational physics

- Past work centered mostly around research in astronomy, particle physics, and machine learning applications

UC DAVIS BOOKHEAD

CURRENT PROJECT

- CERN's 6D Tracking Code is used to compute and simulate trajectories of relativistic particles

- However, certain maps are not yet implemented

- Aim to implement such maps in SixTrack's physics manual, in SixTrack's native language—Fortran

- Check maps for numerical stability and correctness as well

CURRENT PROGRESS

- Modified SVN SixTrack distribution makefile to make it work for Mac users

- Began implementation of first map of physical phenomena, Thin RF Multipole, from SixTrack Physics Manual

MULTIPOLE EXAMPLES
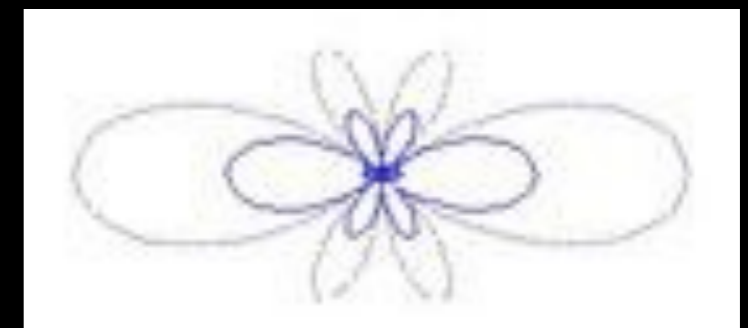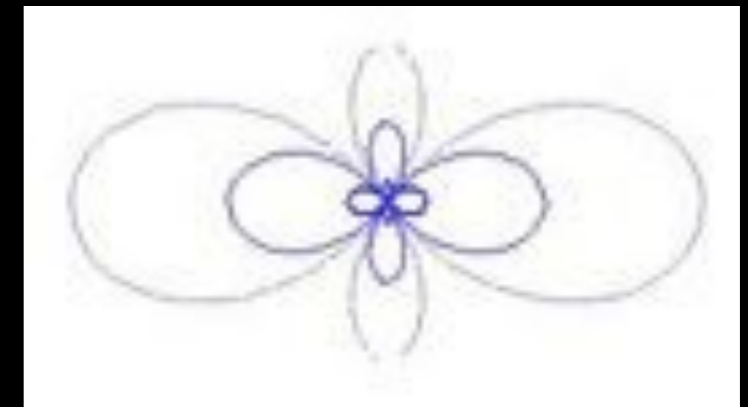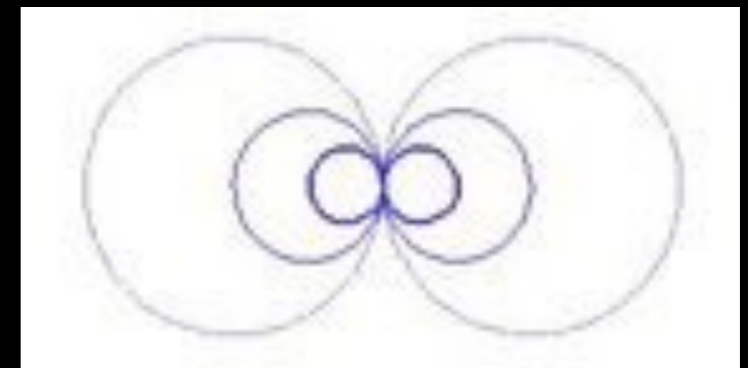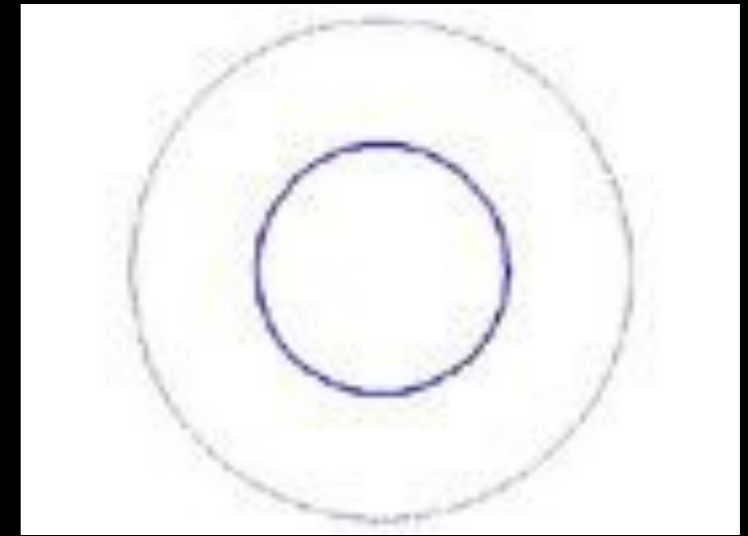
CURRENT PLAN

- Implement relevant equations describing the small kick particle experiences in the vicinity of the thin RF multipole

- While temporary equations are currently used in SixTrack, new equations will account for various physical elements omitted, such as phases of normal and skew coefficients

NEXT STEPS

- Once implementation of Thin RF Multipole in C is complete, move onto Fortran implementation

- Check map for numerical stability and correctness by devising corner case scenarios to run the map under, and evaluate performance

- Follow the above game plan when tackling the other unimplemented maps

NEXT STEPS (CONT'D)

- Other maps to be implemented:

  ➡ Drift Map

  ➡ Thin Dipole Map

  ➡ Thick Dipole Map

  ➡ Thin Combined Function Magnet Map

Would like such maps operational in new C library as well as the old legacy code (Fortran).

Q & A ?