



Vertical Steering on the University of Maryland Electron Ring

Claudia Richoux (University of Chicago)

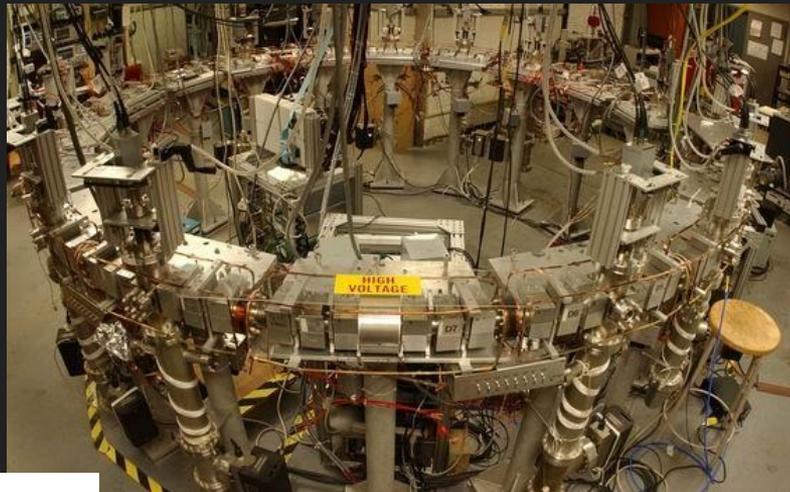
K. J. Ruisard B. L. Beaudoin (University of Maryland)

TREND 2016
Training and Research Experiences in Nonlinear Dynamics

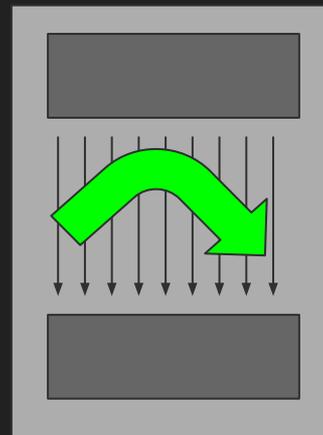
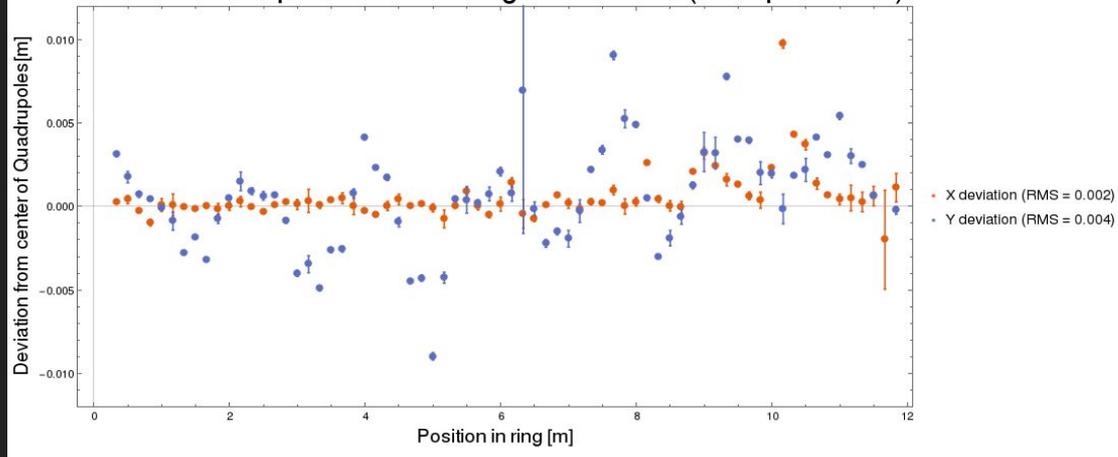
REU program sponsored by the
National Science Foundation
Award Number: PHY1507964



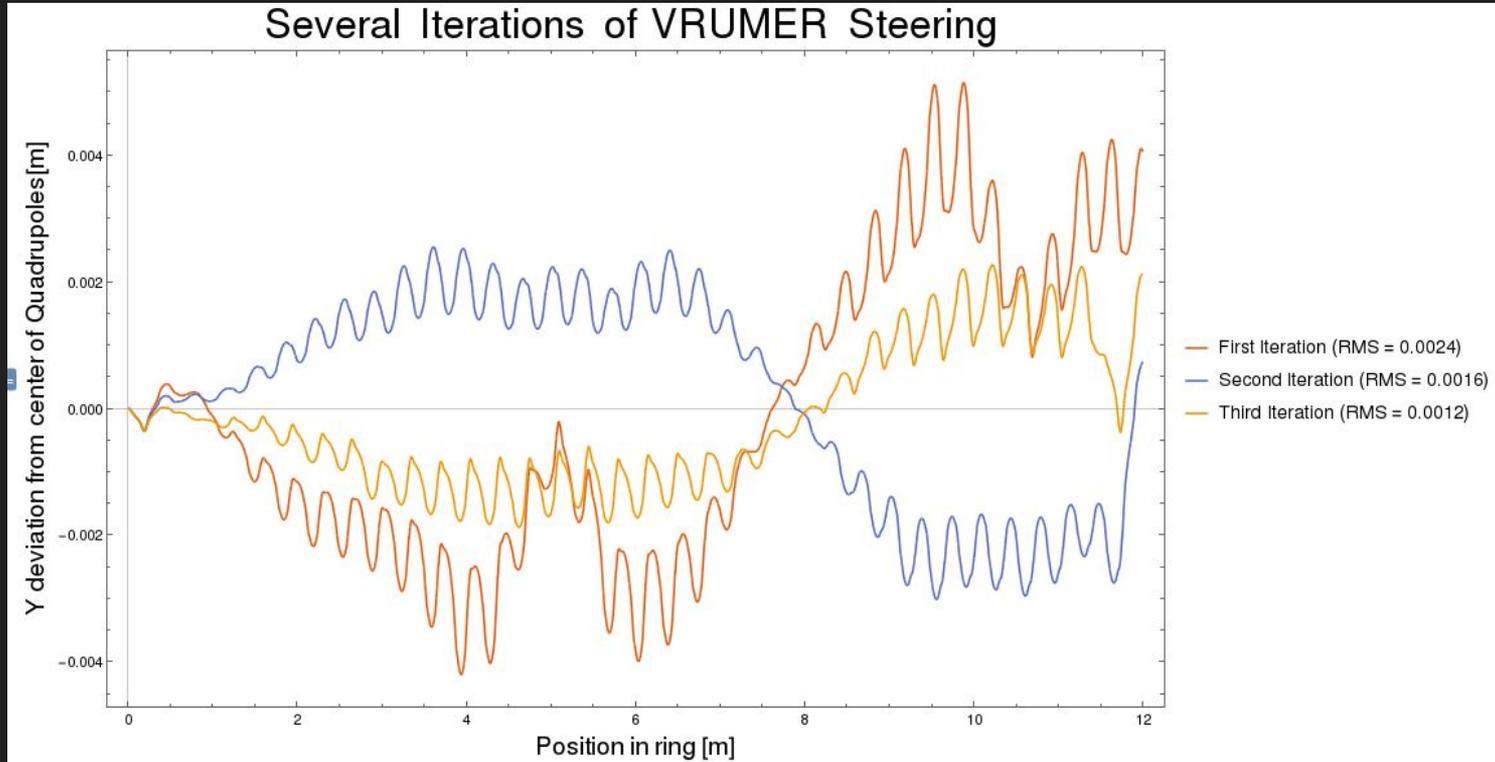
UMER



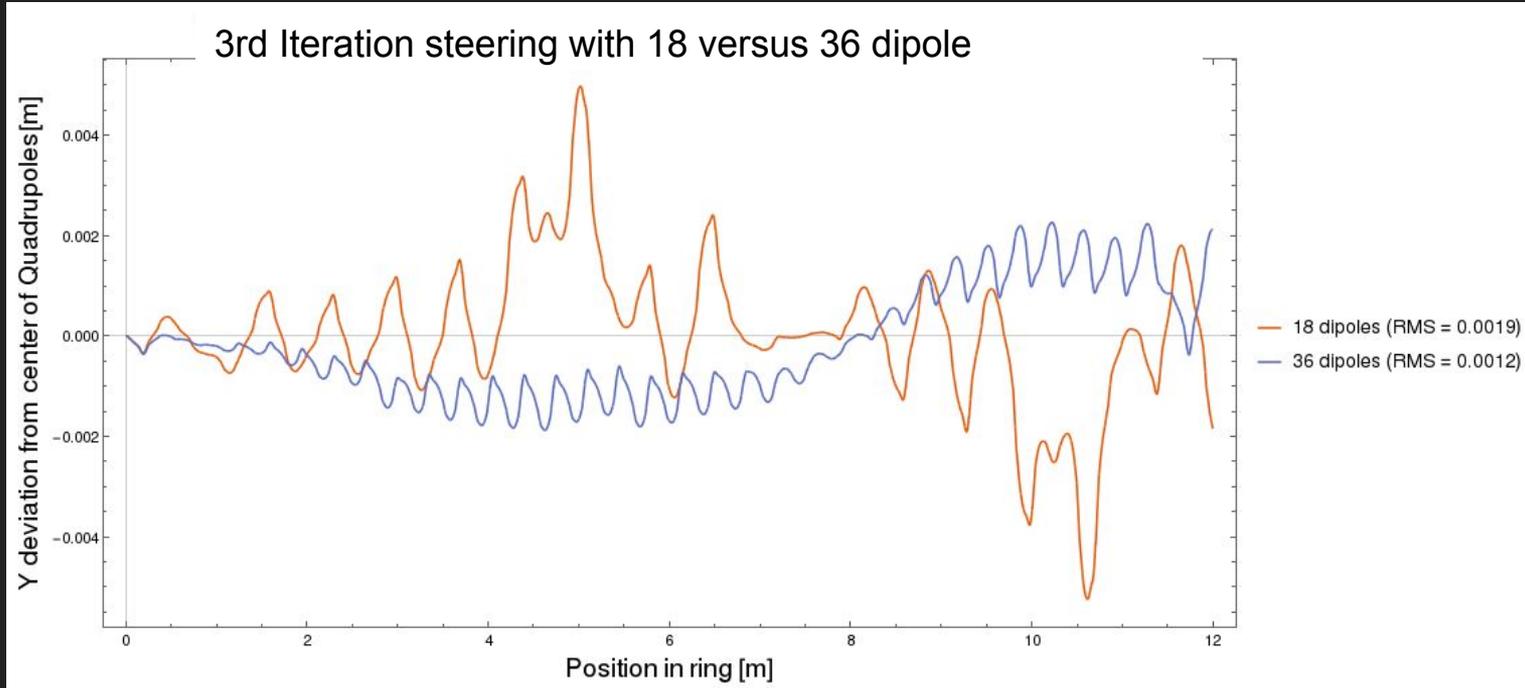
Current best possible steering on UMER (in experiment)



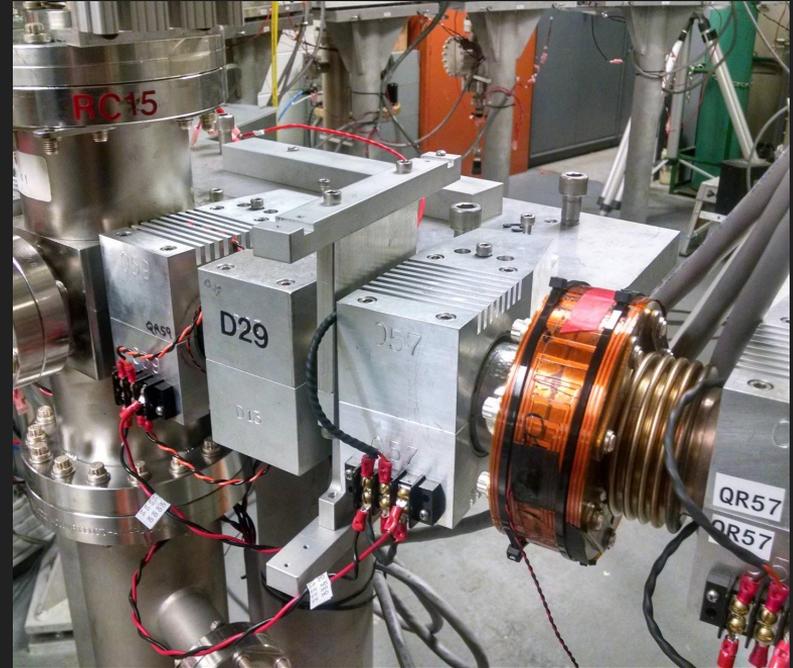
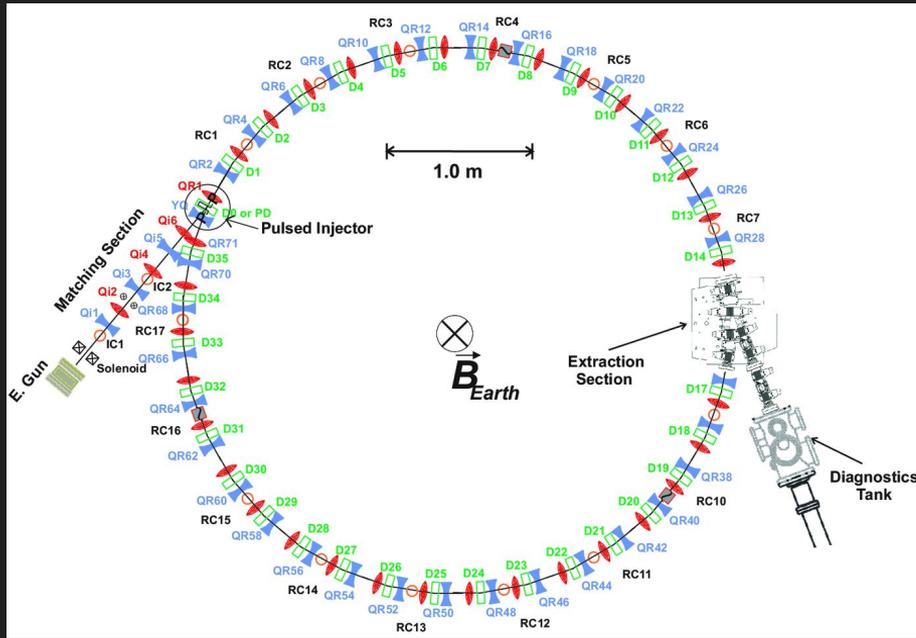
ViRtual UMER (VRUMER) and Steering Algorithm



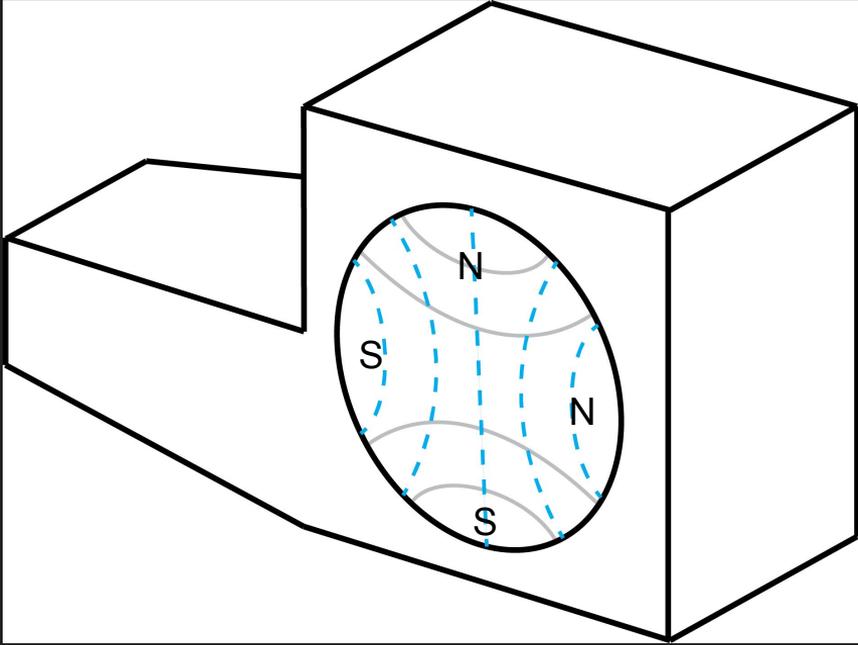
Simulation Method and Results



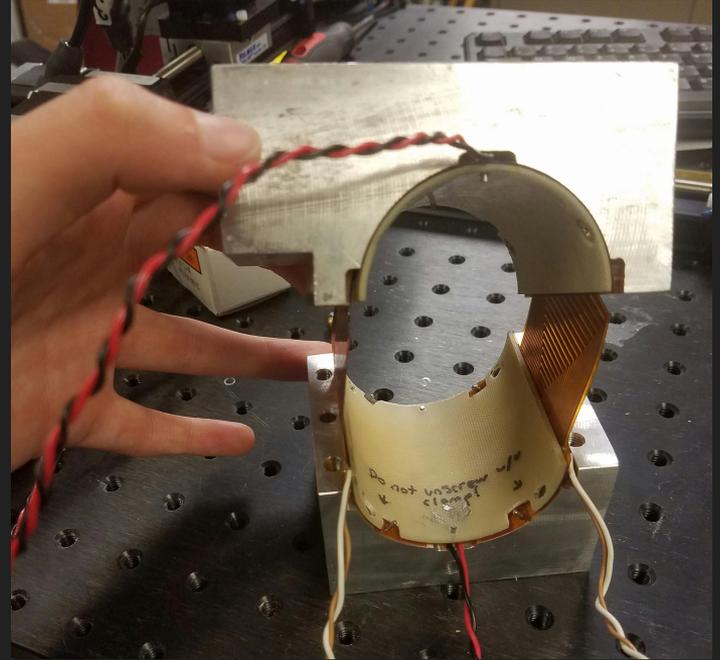
Proposed Setup



Proposed Magnet Changes

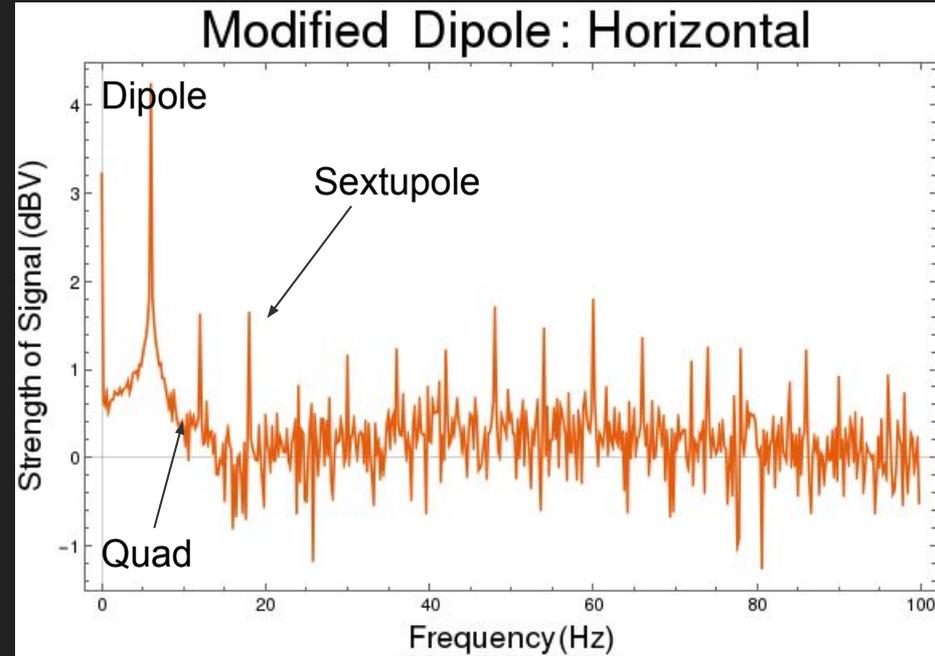
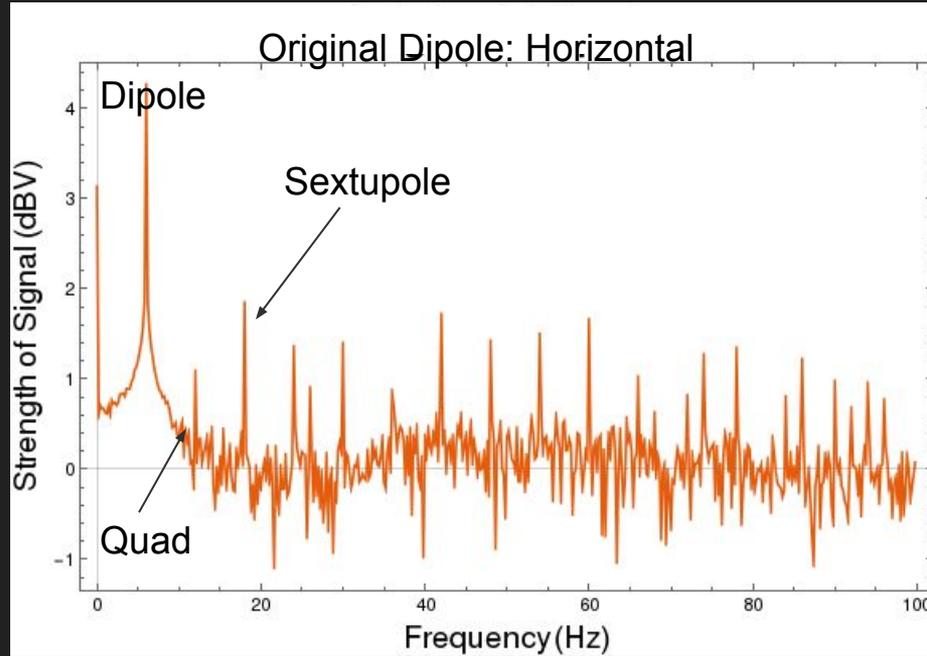


Two combined dipoles in one mount



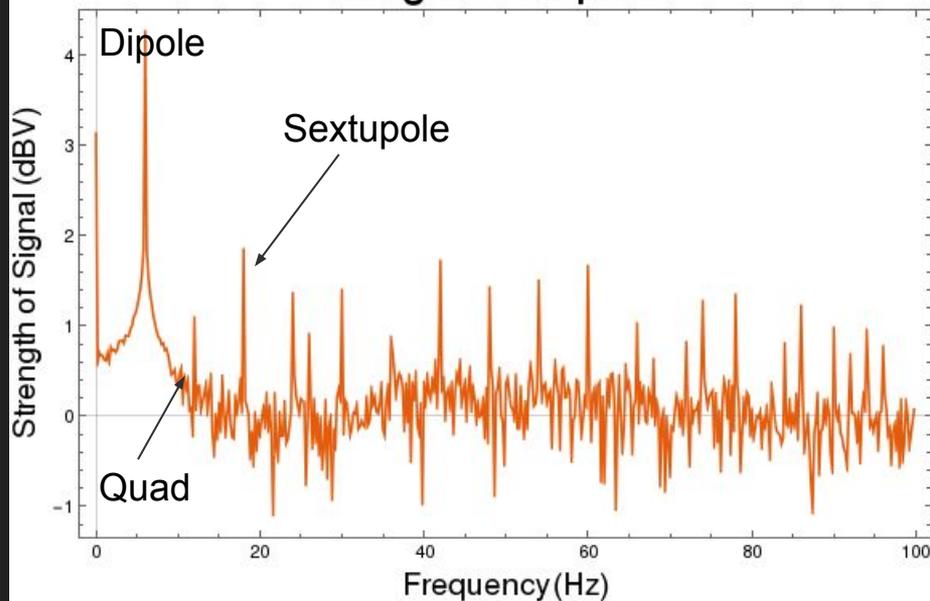
New magnet being assembled

Rotating Coil Test- Horizontal

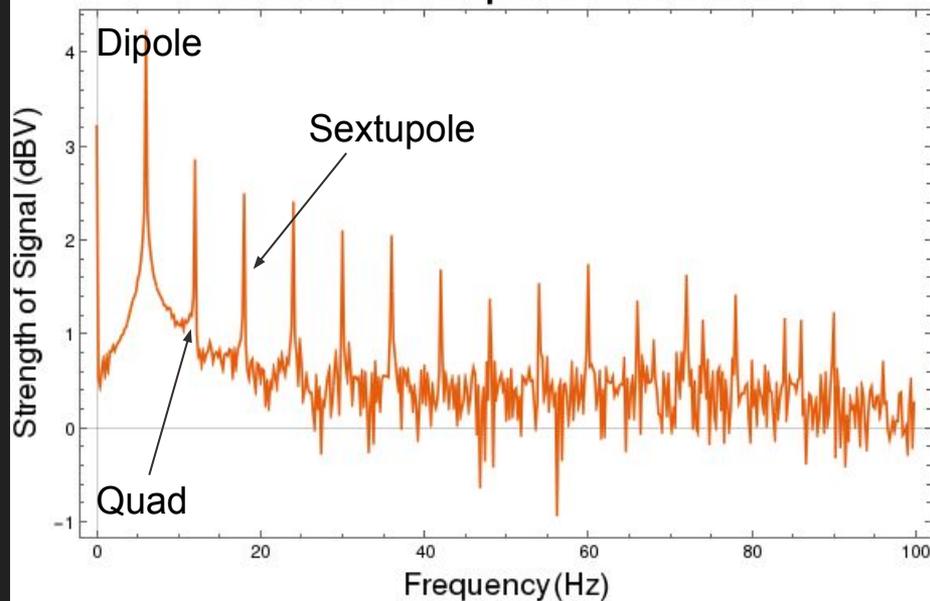


Rotating Coil Test- Vertical

Original Dipole



Modified Dipole: Vertical



Conclusions

- UMER's vertical steering is suboptimal
- I found in simulation we need 36 strong vertical steerers to fix it
- Modifying existing dipoles is cost, time, and space-efficient
- Designed and machined a prototype magnet
- Measurements were very promising

Future Work

- Another higher-precision prototype
- Constructing all 36 dipoles
- Testing improved vertical steering
- COOL NEW EXPERIMENTS!

Citations

Haber, Irving, “VRUMER”, Software, University of Maryland, 2016.

Hui Li, "PRINTED-CIRCUIT MAGNETS SYSTEM FOR UNIVERSITY OF MARYLAND ELECTRON RING," Masters Thesis, University of Maryland, 2001.

Ruisard, Kiersten, “Vertical Steering Note”, Technical Note, University of Maryland, 2015.