Introduction
- Anomalous cosmic rays (ACRs) are the highest energy cosmic rays produced within the solar system
- Voyager spacecraft crossed the termination shock and observed increasing ACR intensity
- What other mechanism could be accelerating particles?

Methods
To show that ions gain energy by bouncing inside magnetic islands
1. Show that islands are contracting
2. Show that ions are bouncing inside
3. Show that ions gain energy at the bounce

Fermi Acceleration
- Requires collisionless regime, high initial ion velocity
- First, second order versions – which would be expected?
- Consider average energy gain per bounce

Conclusions
- Ions are accelerated by bouncing around contracting magnetic islands in a first-order Fermi process
- Proportionality constant $k$ is independent of island geometry

Future Questions
- Ions must interact with many islands to gain sufficient energy – how does this occur?