As the number of \( m=0 \) modes is reduced the plasmoid instability can accelerate reconnection. Reconnection time is much faster than Sweet-Parker that is well modeled by single fluid resistive MHD.

**Plasmoid Like Structures Seen in MST and Drss Simulations**
- Truncating the \( m=0 \) mode spectrum increases the sawtooth duration.
- Multiple reconnection pathways generate complex island structures at reversal surface.
- Structure is topologically similar to "plasmoid" type instabilities that occur during magnetic reconnection and lead to enhanced current flow rate.
- Similarly, sawtooth crash duration scales with number of allowed \( m\) modes.

**Can Now Explore Ion Acceleration with RIO**
- RIO is a novel means for heating, magnetic field line and chassis experiences.
- Particle tracer computes the full particle orbit.
- Conducting fluctuations and electric field from Debs input.
- Allows the exploration of ion acceleration due to intrinsic electric field.
- Collateral and transverse can be included.
- Electric drag, pitch angle scattering and shape exchange taken into account.
- Guides need to determine magnetic diffusion and ion acceleration.

**Debs Reproduces the Observed Equilibrium Evolution**
- The resistivity profile is fixed to have the same 
  - resistance in the core region for all cases.
- Sensitivity of the resistivity profile to the neutralized magnetorotational instability is accounted for.
- The equilibrium quantities are ensemble averaged.
- The ensemble averaged experimental data is compared to ensemble averaged experimental data.

**Sawtooth Crash Duration Asymptotes to MST Value of 50\( \mu \)s**
- Sawtooth crash duration in MST is the reference data.
- The number of \( m\) modes is varied from Debs output.
- The sawtooth duration in MST is compared to the number of \( m\) modes.

**Motivation**
- The equilibrium quantities are an intrinsic feature of the equilibrium.
- These quantities are in good agreement with measured profiles of many equilibrium.
- The equilibrium quantities can be measured.
- The equilibrium quantities are 
  - self-consistent with the experimental data.
- The equilibrium quantities are 
  - used to determine magnetic diffusion and ion acceleration.

**Conclusions**
- DEBS Reproduces the Observed Equilibrium Evolution
- Sawtooth evolution of \(|n|\leq10\) case from Debs
- Sawtooth evolution of \(|n|\leq4\) case from Debs
- Sawtooth evolution of \(|n|\leq10\) case from Debs
- Sawtooth evolution of \(|n|\leq4\) case from Debs
- Sawtooth evolution of \(|n|\leq10\) case from Debs
- Sawtooth evolution of \(|n|\leq4\) case from Debs
- Sawtooth evolution of \(|n|\leq10\) case from Debs
- Sawtooth evolution of \(|n|\leq4\) case from Debs
- Sawtooth evolution of \(|n|\leq10\) case from Debs
- Sawtooth evolution of \(|n|\leq4\) case from Debs
- Sawtooth evolution of \(|n|\leq10\) case from Debs