Evolution of the periodicity of magnetic orbits around the magnetic axes during a Sawtooth crash ALLEN SANDERSON, SCI Institute, Univ. of Utah, NATHANIEL FERRARO, General Atomics, STEPHEN JARDIN, PPPL, VACET COLLABORATION, CEMM COLLABORATION — In this talk/poster, we present some initial research into the evolution of the periodicity of magnetic orbits around the magnetic axes during a Sawtooth crash. In the Kadomtsev sawtooth model, the magnetic axis shifts and merges with the q=1 surface, and is replaced by a magnetic island formed by the reconnection. We have been able to observe the evolution of the periodicity of magnetic orbits around both the old and new axes during this process. During the sawtooth, which magnetic axis should be considered the "true" axis is ambiguous; thus, the traditional definition of the safety factor becomes ill-defined. We consider the evolution of q and p, where p and q are the ratio of the toroidal to poloidal transits around the two axes. Generally, p and q are not equal during the sawtooth process. The magnetic fields during the instability are calculated using the extended-MHD code M3D-C1. The periodicity of the magnetic orbits are dynamically illustrated using new field-line tracing capabilities implemented in the visualization software VisIt.

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