Abstract Submitted
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Sawtooth Oscillations and Helicity of Magnetic Clouds[1] JOHN PETERSEN, UTSA undergraduate — When an interplanetary magnetic field (IMF) running north-south encounters the Earth's south-north magnetic field, magnetic reconnection occurs, and solar wind plasma is injected through the resulting gap in the magnetosphere. This process, known as a geomagnetic storm, can have substorms with different characteristics. One such substorm is a sawtooth event or sawtooth oscillation. These quasi-periodic oscillations are caused by a specific type of IMF called a magnetic cloud. It is postulated herein that the helical structure of magnetic clouds as they are incident upon the magnetosphere is the root of the quasi-periodicity. Furthermore, a simple calculation (H = 1/vt) can predict the helicity of the magnetic cloud, within the statistically accepted range, using the periodicity of the sawtooth oscillation and the velocity of the magnetic cloud for t and v, respectively.

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