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Kinetic Alfvén Eigenmodes and Particle Acceleration in Near-Earth Space CHRISTOPHER CHASTON, UC Berkeley, VAN ALLEN PROBES TEAM TEAM — We present observations of filamentary electromagnetic structures in Earth's inner magnetosphere. These structures have the characteristics of Alfvénic eigen-modes of the geomagnetic field on scales comparable to the average ion-gyro-radii of the supporting plasma. It is shown how these field structures extract ions from the ionosphere and drive them into the magnetosphere with energies orders of magnitude larger than that their ionospheric source. These features are observed nearly continuously during intervals of enhanced geomagnetic activity known as geomagnetic storms. As the ions accelerated in these waves gradient/curvature drift in the geomagnetic field they will make a substantial contribution to global magnetospheric plasma pressure and alter the drift paths of all inner magnetospheric plasmas. These waves may therefore be a heretofore unknown controller of the magnetospheric response to space weather events.

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