



Wave Energy Budget in the Earth Radiation Belts

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Whistlers are important electromagnetic waves pervasive in Earth's magnetosphere, where they continuously remove or energize electrons trapped by the geomagnetic field, controlling radiation hazards to satellites and astronauts and ionization or chemical composition in the upper-atmosphere. Here, we report an analysis of ten-year Cluster data, evaluating for the first time the wave energy budget in Earth's magnetosphere and revealing that a significant fraction of the energy corresponds to hitherto generally neglected very oblique waves. Such waves, with ten times smaller magnetic power than parallel waves, typically have similar total energy. Very oblique waves may turn out to be a crucial agent of energy redistribution in Earth's radiation belts, controlled by solar activity.