



Magnetospheric plasma waves and radiation belt dynamics

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Electromagnetic waves propagating in and interacting with the plasma medium represent a unique mechanism of energy transfer in the nearly collisionless environment of the Earth's magnetosphere. The propagating plasma waves thus ultimately affect the distribution functions of energetic particles trapped in the Van Allen radiation belts and control their overall fluxes. Depending on the actual situation and conditions, they may be responsible both for the energization and loss. We present a brief overview of the radiation belt dynamics, discussing the energetic particle trapping in the Earth's magnetic field, along with their main source and loss mechanisms. We further focus on selected important wave phenomena observed in the Earth's inner magnetosphere, introducing their basic classification and properties. Recent spacecraft data and scientific results are used to demonstrate the progress in our understanding of these amazing near-Earth space phenomena.