



## **Wave-Particle Interaction Between Ring Current Injections and Plasmasphere**

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Recent observations by Van Allen Probes suggest a connection between hot plasma injections ( $\sim 10$  keV) and heating of the background plasmaspheric population. As indicated by the HOPE instrument, the ion distributions in the ring current region are non-Maxwellian, with a warm plasma of a few hundred eV heated perpendicular to the magnetic field at certain energies and showing field-aligned distributions at other energies. In addition, ion distributions and heating are different for different ion species. The distributions observed are favorable for the generation of EMIC and/or magnetosonic wave. We analyze several cases of plasmaspheric heating in the presence of wave activity. The waves are identified as magnetosonic waves in the presence of unstable distributions of newly injected plasma. In order to understand the relationship between hot plasma distributions, wave activity and plasmaspheric dynamics, we use the CIMI model of ring plasma and plasmasphere. Based on Van Allen Probes data and calculated wave growth rates, we use a "toy model" in CIMI to describe the creation of a heated warm plasmaspheric population. The HOPE instrument spectrograms and the EMFISIS instrument plasma profiles are compared to the CIMI output. The data-model comparison confirms that magnetosonic waves are likely the source of observed plasmaspheric heating. In conclusion we discuss the role of the warm plasma population in the ring current dynamics.