Excitation of EMIC waves detected by the Van Allen Probes on 28 April 2013

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Abstract. We report the wave observations, associated plasma measurements, and linear theory testing of electromagnetic ion cyclotron (EMIC) waves observed by the Van Allen Probes on 28 April 2013. The waves are detected in their generation regions as three individual events in the two consecutive orbits of the Van Allen Probes-A, but the other spacecraft, B, does not detect any significant EMIC wave activity during the period. Present are three overlapping H^+ populations around the plasmapause during the waves. It is found that the difference between the observational EMIC wave growth parameter (Σ_h) and the theoretical EMIC instability threshold (S_h) is significantly raised, on average, to 0.32±0.03, 0.43±0.02, and 0.32±0.02 during the three waves, respectively. Compared to linear theory ($\Sigma_h > S_h$), they are elevated thresholds for EMIC wave excitation.

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