



Geomagnetic Storms and EMIC waves: Van Allen Probe observations

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Electromagnetic Ion Cyclotron (EMIC) waves are believed to play a crucial role in the dynamics of ring current ions and radiation belt electrons, especially during geomagnetic storms. However, there is little consensus on which phase of the storm is more favorable for the generation of EMIC waves. Utilizing the data from magnetometer instrument of EMFISIS suite on board Van Allen Probe A, the occurrences of EMIC waves during geomagnetic storms are investigated in this paper. 76 storms were identified during the period under research, from 8 September 2012 to 30 April 2014, when the apogee of Van Allen Probe A covered all the MLT sectors. 50 of the 76 storms observed 124 EMIC wave events, of which 80 are found in the recovery phase, more than those observed in the main phase. Evolution of the distribution characteristics of EMIC waves respect to L and MLT in different geomagnetic phases is investigated, which is found to be consistent with that of the plasmasphere. These results are different from those derived by the observations of the CRRES satellite. The different results may result from the different orbit coverage of the two different satellite missions or from the different activity level of the magnetosphere during the different periods. Few EMIC waves in the dayside sector during the pre-onset periods are observed. It is implied that, to the generation of EMIC waves, the effect of solar wind dynamic pressure in the inner magnetosphere is not so significant as that in the outer magnetosphere.