# Statistical study of the NTC plasmaspheric patches: a direct link between wave observation in the inner magnetosphere and magnetic activity

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**Abstract**

Variations in the solar wind are responsible of reconfiguration of the whole magnetosphere. The plasmapause is located in the inner magnetosphere and a direct link between its characteristics and the magnetic activity has been shown. NTC is believed to be emitted at the plasmapause and near the magnetic equator. The changes of the plasmapause due to solar wind variations may be reflected in the wave signature. Using three years of Cluster data we perform a statistical study. We show that their observation is linked with a compression of the plasmapause, and an increasing of the magnetic indices.

## Introduction

Variations in the solar wind are responsible of reconfiguration of the whole magnetosphere. The plasmapause is located in the inner magnetosphere and it has been shown a direct link between its extension and shape and the magnetic activity. Non-thermal continuum (NTC) radiation is believed to be emitted at the plasmapause and near the magnetic equator. The changes of the plasmapause due to solar wind variations may be reflected in the wave signature.

## 1. The NTC patch study

In a recent study, a particular type of NTC radiation, referred to as NTC plasmaspheric patch has been identified. It has been shown that this spectral signature only exists close to its source region. The Cluster perigee is located at 4 $R_E$, in the plasmapause region. Using three years of Cluster data we perform a statistical study about the NTC plasmaspheric patches and their sources position, the angular opening of the beam, the plasmapause position and the evolution of the magnetic activity.

## 2. Conclusion

Our results show that NTC plasmaspheric patches observation is the signature of an increasing of the magnetic activity. It is linked with a compression of the plasmapause, and an increasing of the magnetic indices. Moreover, the study of some cases indicates that MHD waves are observed at the same time than plasmaspheric NTC patches.

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