

**R007-07**

**Zoom meeting B : 11/2 PM2 (15:45-18:15)**

**17:15~17:30**

## **太陽 II 型および III 型電波バーストと高エネルギー粒子現象との関係**

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## **Relationship between solar energetic particle events and metric ? kilometric type II/III radio bursts**

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It is known that type II and III bursts are sporadic and intense solar non-thermal radio phenomena, which are generally generated with coronal mass ejection (CME) and flare events, respectively. The bursts are also known to be highly correlated with the occurrence of solar energetic particles (SEP) with the energy of more than the MeV grade (ex. Miteva et al., 2017): type II bursts often occur with 'gradual' type SEP events, while type III bursts often occur with 'impulsive' type SEP events (ex. Reams, 2012). Since the fluence of energetic particles of gradual SEP events are generally larger than the that of impulsive SEP events, type II bursts are often more intensively analyzed to investigate their relationship, such as spectral characteristics of type II bursts with the magnitude of SEP. However, a theoretical study based on diffusive shock acceleration for generating sufficient amount of 'gradual SEP' requires pre-accelerated 'seed' particles (ex. Tylka & Lee, 2006). One of the candidates of the 'seed' particles is thought to be those generated though flares, so the investigation of the relationship between gradual SEP events and type III bursts is also important as well as that for type II bursts.

We have analyzed the relationship between SEP events and metric to kilometric type II/III radio bursts for investigating which spectral characteristics of the bursts including fine structures affect fluence & energy of SEP. In the analyses we have used the radio wave data observed by the IPRT/AMATERAS and Zao systems (Tohoku Univ.) in the metric - decametric wave ranges, the Nancay Decametric Array (Obs. de Paris) in the decametric wave range and the WIND/WAVES in the hectometric - kilometric wave ranges in main. In the presentation, we will introduce results of the analyses and discuss relationship between SEPs and spectral characteristics of type II/III bursts and also among them.