Oral | Symbol M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

**[M-IS26_29AM2] Atmospheric Electricity**
Convener:*Yasuhide Hobara(Graduate School of Information and Engineering Department of Communication Engineering and Informatics, The University of Electro-Communications), Tomoo Ushio(Information and communication engineering department, Osaka University), Chair:Tomoo Ushio(Information and communication engineering department, Osaka University)

Tue. Apr 29, 2014 11:00 AM - 12:45 PM  422 (4F)

All aspects of research area on Atmospheric Electricity will be discussed in this session, including global circuit, ion and fair weather electricity, thunderstorm electrification, lightning physics, lightning and meteorology, electrical effects of thunderstorms on the middle and upper atmosphere, lightning protection, seismo-electromagnetics, terrestrial electromagnetic environment and so on.

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**[MIS26-P03_PG] Development of polarimetric 2-D phased array weather radar using minimum mean square error method**

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Keywords: phased array radar, MMSE

We have been developing a polarimetric 2-D phased array weather radar which detects small scale phenomena such as tornadoes and downbursts. In this paper, we compare Beam Former method (BF), which is a conventional method in Digital Beam Forming signal processing of array antenna, with Minimum Mean Square Error method (MMSE), which is our proposed method, and discuss simulation results estimated by each method. In BF, antenna pattern is uniform and unique in the radar system, and its sidelobe level is high. As a result, if there are obstacles, for example high building, or very heavy rain area, the observation results of array antenna is imprecision in the region near them. In contrast, we can turn the null-point to interference wave direction at the same time we turn the mainlobe to the desired signal direction in MMSE.