International Session (Oral) | Symbol A (Atmospheric, Ocean, and Environmental Sciences) | A-AS Atmospheric Sciences, Meteorology & Atmospheric Environment

[A-AS01_30PM1]Extreme Weather in Cities

Convener:*Masayuki Maki(ERCDP, Kagoshima University), Jun Matsumoto(Deaprtment of Geography, Tokyo Metropolitan University), Yoshinori Shoji(The Second Laboratory of Meteorological Satellite and Observation System Research Department, Meteorological Research Institute), Tsuyoshi Nakatani(National Research Institute for Earth Science and Disaster Prevention), Chair:Masayuki Maki(ERCDP, Kagoshima University)

Wed. Apr 30, 2014 2:15 PM - 3:45 PM 423 (4F)

It is recognized that large cities with a population of several million people are inherently vulnerable to extreme weathers such as torrential rain, lightning, strong wind, giant typhoon, and heat wave. It is argued that the occurrence of extreme weather phenomena tends to increase due to the climatic change. Cooperating with domestic and international academic scientists, the session will focus on the mechanism of extreme weather, its monitoring and prediction methods, effects of urbanization on hazards, and social experiments on resilient cities.

3:00 PM - 3:15 PM

[AAS01-P02_PG]Development of high resolution spatio-temporal precipitation data using a network of polarimetric X-band radars in Japan

3-min talk in an oral session

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Keywords:convective cell, X-band polarimetric radar, high resolution precipitation data

Localized convective precipitation develops rapidly in a very short time and is conducive to extreme local rainfall amount. The X-band polarimetric radar is useful to analyze the convective precipitation because it can provide us polarimetric radar parameters which are useful to understand microphysical process in the precipitation. However, the radar observation has some limitations in detecting initial stage of rapidly developing convective cell; the radar volume scan strategy adopted in operational radar is 5 minute interval which is not enough for measuring rapidly developing convective precipitation. To detect the early stage of convective cell, we developed the algorithm which is based on the interpolation method both in space and time. The algorithm reproduces higher resolution spatio-temporal volumetric data using the operational network of four X-band polarimetric radars. The mosaic of multiple radars could be benefit for increased sampling into a certain volume. In addition, different scan strategy at each radar also improve spatio-temporal resolution. The algorithm is applied to radar data of convective precipitations observed in Kanto area in 2012. The new volumetric data can recognize more detail about echo which developed rapidly and detect the first appearance of convective echo at upper layer. Early detection of convective precipitation at upper layer can be useful for nowcasting or very short-term forecasting.