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## [A-AS01_30PM1] Extreme Weather in Cities

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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.

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15:00 ～ 15:15

# [AAS01-P04_PG]Xバンド偏波レーダと Cバンド在来型レーダを用いた高時空間分解能合成雨量

ポスター講演3分口頭発表枠

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キーワード：偏波レーダ, Xバンド, 降水量, 高分解能, MPレーダ

Radar with shorter wavelength such as the X-band (3-cm) wavelength has several advantages compared to C- and S-band radar. First, X-band wavelength radar has high sensitivity of the specific differential phase of the rain rate. Second, it is possible to achieve finer spatial resolution more economically; for example, X-band wavelength radar can achieve a 1 degree beam width with a 2 m diameter parabolic antenna, while S-band needs a 7 m diameter antenna to achieve the same beam width. Third, due to advantage number two, X-band radar is easier to setup in mountainous areas, and at lower cost compared to S- and C-band wavelength radar. In Japan, success in the detection of torrential rainfall that occurred in Tokyo in 2008 triggered the deployment of 35 operational X-band polarimetric radars in major urban cities by MLIT. This radar network named XRAIN provides rainfall information with high spatio-temporal resolution. In US, the X-band polarimetric radar network is constructed in Dallas Fort Worth, which is a research and innovation network linking academic researchers, local stakeholders, and industry to address water issues as they relate to urban sustainability. In Europe, The project named RAINGAIN is ongoing to improve fine-scale measurement and prediction of rainfall and to enhance urban pluvial flood prediction. Activities include the implementation and use of advanced radar technologies (X Band) in Leuven, London, Paris, and Rotterdam. Although X-band polarimetric radar has the advantages mentioned above and used in hydrological applications, there are essential disadvantages. First, the maximum range is shorter than that of C-band and S-band radar; maximum ranges of 200km or 300km are easily obtained in case of C- and S- band radar, while that of X-band radar is limited to 30km-60km. Second, signal extinction area which is defined as the area where the received signal is below the receiver noise level occurs behind heavy rainfall areas. These disadvantages will be a fatal flaw when extremely heavy rainfalls occur. Authors have experience that the maximum observation range of X-band radar was shorter than 3km when heavy rainfall passed over the radar site. The present paper aims to develop an algorithm to overcome these disadvantages. The method is based on the C-band and X-band radar composite map which attains the 1 minute time resolution and 250m spatial resolution by the

interpolation method. The algorithm is applied to the heavy rainfall case observed on 12-14 July, 2012 in northern Kyusyu, Japan. The algorithm is validated with surface raingauge network: the composite radar rainfall estimation agreed well with raingauge data.