Oigawa, M., E. Realini, H. Seko, and T. Tsuda, 2014: Numerical Simulation on Retrieval of Meso-γ Scale Precipitable Water Vapor Distribution with the Quasi-Zenith Satellite System (QZSS). *J. Meteor. Soc. Japan*, **92**, 189–205.
http://dx.doi.org/10.2151/jmsj.2014-301

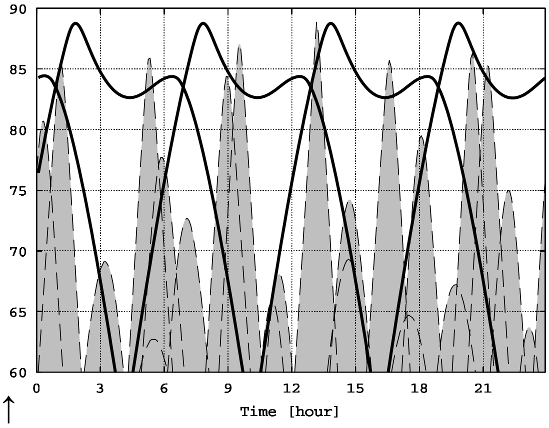

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Figure 1. Time variation of elevation angles of GPS (dashed line) and QZSS (solid line) satellites. Values observed at GEONET station 0347 on 28 July 2011.

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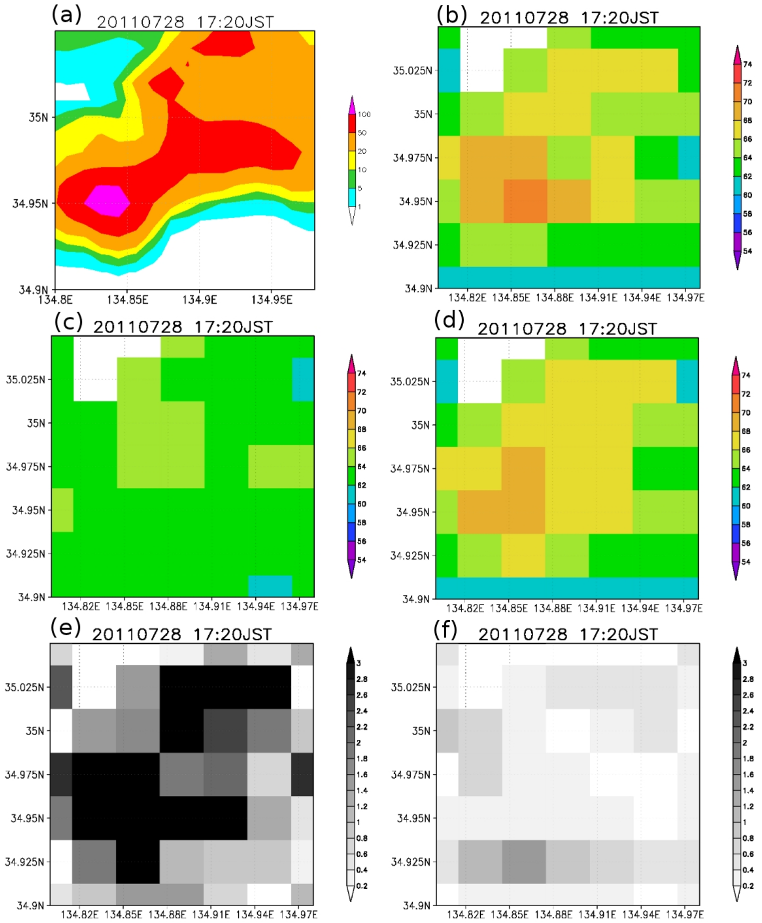

Figure 2. (a) Horizontal distribution of precipitation intensity (mm/hour) at 17:20 LST. (b), (c) and (d) are horizontal distribution of PWV (mm) of the reference value of the model, PWV_G and PWV_Q, respectively. (e) and (f) are the horizontal distribution of RMSE (mm) of PWV_G and PWV_Q, respectively.

- Effects of different geometries of global positioning satellites on estimation of meso-γ scale Precipitable Water Vapor (PWV) distribution were investigated by numerical simulation. We focused on QZSS in which at least one satellite exists close to the zenith, that is, at an elevation angle higher than 80° over Japan (Figure 1).
- Fine structures of PWV distribution caused by convections were smoothed out by conventional analysis method (PWV_G). By contrast, they were well captured by high-elevation slant paths, which were obtained by high elevation QZSS satellite (PWV_Q)(Figure 2).
- It was demonstrated that the standard deviation of the PWV error, which was difference from the vertically integrated value of water vapor, was reduced when PWV was estimated from only high-elevation single slant paths. It was also shown that QZSS mitigated significantly discontinuities in the PWV time series that were caused by the change of the highest satellite.