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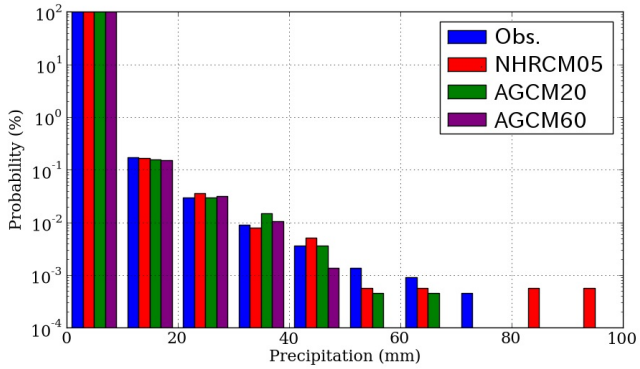

Fig. 1. Probability density function (PDF) of hourly precipitation data at the (blue) Tokyo observation site and PDFs simulated with the (purple) AGCM60, (green) AGCM20, and (red) NHRCM05 models at the Tokyo observation site.

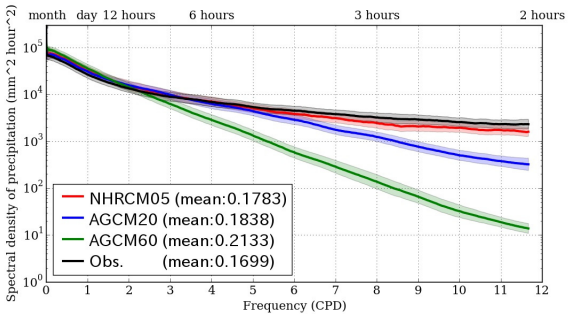

Fig. 2. Power spectrum of hourly precipitation data at the Tokyo observation site is shown. The numbers in the legend are the annual mean precipitation rate in mm h^{-1}. Shaded area indicates the 95% confidence interval of the mean value of the power spectrum.

- This paper clarifies that the skillful time-scale characteristic of a model is one of the key factors to reproduce the amount precipitation at a specific place with the model. A comparison with data from an operational observing site of the Japan Meteorological Agency in Tokyo revealed that a model needed at least 5-km-grid resolution (NHRCM05) to represent the power spectrum of hourly precipitation.
- Figure 1 indicates the PDF of hourly precipitaion around the Tokyo site. It is difficult to characterize extreme hourly precipiation by using the AGCM20/60 models. However, the NHRCM05 model could simulate extreme precipitaion events.
- To clarify the cause of the difference, we obtained a power spectrum of precipitaion (Fig.2). We found that they were very similar at frequencies lower than 1 cycle per day (CPD). However, at frequencies greater than 1CPD, the simulated power was lower in lower resolution models (AGCM20/60).