

Impact of distantly located typhoon and the North Pacific subtropical high on precipitation in Japan

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It is known that the effects of typhoon on precipitation can be divided into direct effects and indirect effects depending on the location of the typhoon [e.g., Wang et al. 2009]. In other words, it is distinguished whether the cloud area which caused precipitation is the typhoon itself. In this study, we mainly investigated the effects of distantly located typhoon on precipitation in Japan, that is, indirect effects. During the Baiu/Meiyu season and Akisame (autumn rain) season, typhoon increases the inflow of surrounding water vapor to the rain front. As a result, enormous rainfall is produced in Japan, so typhoon has a key role in the viewpoint of heavy rain forecasting. Although there are more than 10 typhoons approaching Japan each year, it will not rain if there is no front over Japan at that time, so there are not many cases of remote precipitation. Therefore, the analysis focused on some typical cases that occurred after the year 2000. In general, the subtropical high is a divergent area of water vapor flux and the amount of evaporation is larger than precipitation, suggesting that it is a water vapor source like a typhoon.

We characterized the global environmental field of remote precipitation which is covered not only around the typhoon but also a wide region, using the reanalysis data and the satellite precipitable water vapor data. In addition, we used Nonhydrostatic Icosahedral Atmospheric Model (NICAM) for simulations of horizontal resolution 14 km. The typhoon targeted for simulations are Songda (2004) and Melor (2009). Among the remote precipitation cases, we compared the differences in the precipitable water and the location of the subtropical high. This time, we will introduce an interim report about the obtained results.

Key words: Remote Precipitation, Water Vapor Transport, NICAM

References

Wang, Y. Q., Y. Wang, and H. Fudeyasu (2009), The role of Typhoon Songda (2004) producing distantly located heavy rainfall in Japan, *Mon. Weather Rev.*, 137, 3699–3716.