

Water vapor monitoring over the ocean using a shipborne GNSS receiver

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Experimental cruises were conducted with a global navigation satellite system (GNSS) antenna installed facing the zenith on the deck of the research vessel to investigate the accuracy of precipitable water vapor (PWV) and benefits of multi-GNSS processing. Also, more than 100 profiles were observed by radiosondes released from the ship during the experiment. Using multi-GNSS signals improved the estimation accuracy of PWV on the vessel. The root means square (rms) and bias of PWV between GPS and radiosonde observations was smaller in the case of multi-GNSS.

Although some microwave satellites observe oceanic water vapor, they are insufficient for in-depth study of air-sea interaction. GNSS-PWV is advantageous because of its high accuracy and temporal resolution, and it would be useful for numerical weather predictions, such as for typhoons or hurricanes.

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