Impact of Typhoon-induced sea surface cooling on the track of next Typhoon

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Typhoons (TCs) MATMO, HALONG, and NAKRI (2014), which caused Japan catastrophic disaster, landed the western part of Japan. The TCs came to Japan one after another during late July to early August 2014. The tracks of these TCs were similar, i.e., the TCs followed the western edge of the subtropical northwestern Pacific high (SNPH). However, the tracks gradually reached to Japan, which were associated with weakening the westward expansion of the SNPH. It was found that the changes in westward expansion of the SNPH were associated with TC-induced sea surface cooling of previous Typhoon. It has previously been reported that TC-induced sea surface cooling is mainly caused by Ekman upwelling and vertical turbulent mixing. The TCs MATMO, HALONG, and NAKRI passed around the Philippines, and induced sea surface cooling of this area. The sea surface temperatures of this area are important for Pacific-Japan pattern, which was associated with the westward expansion of the SNPH. Consequently, previous Typhoon induced sea surface cooling around the Philippines, which weakening the westward expansion of the SNPH. Then, the tracks of next Typhoon were changed, and gradually reached to Japan.

Key words: air-sea interaction, typhoon track, Typhoon-induced sea surface cooling