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Formation of Tropical Cyclones within the Eastward Propagating Intraseasonal Oscillation in the Western North Pacific during Boreal Summer

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The relationship between the tropical cyclone formation in the western North Pacific and the eastward propagating intraseasonal oscillation in the equatorial Pacific is investigated using blackbody temperature from GMS, ECMWF reanalysis and the best track of tropical cyclone during boreal summer in 1997.

A super cluster passed through the western equatorial Pacific from the beginning to end of July. A tropical cyclone (T9709) was formed at 13°N and 137°E on 20 July when the equatorial intraseasonal oscillation was in the active phase. This cyclone originated from the cloud cluster at 10°N and 140°E on 17 July, which is located in the northern part of the cloud region of the super cluster.

Before the super cluster passed, the geopotential height at 850 hPa decreased in the western Pacific. It is found that the westerly increased to the west of the low geopotential height area and that the westerly extended eastward. This corresponds to the eastward propagation of the low geopotential height area. On the other hand, the easterly increased to the north of the low geopotential height area. The maxima of the easterly and the westerly below 500 hPa were located at 15°N and 5°N, respectively. Both these zonal winds were intensified in middle July and relative vorticity increased at 10°N and 140°E. The intensification of the vorticity resulted in the formation of the tropical cyclone (T9709).

Keywords: intraseasonal oscillation; tropical cyclone; western North Pacific.