Precipitation distributions and cold conveyer belt associated with rapidly developing cyclone over the northwestern Pacific Ocean

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The precipitation distributions associated with the rapidly developing cyclones over the northwest Pacific Ocean are classified by the effect of moisture supply from sea surface on the cold conveyor belt. The difference between the 2 m temperature and the sea surface temperature (ΔT ≡T - SST) of the cyclone northern semicircle is used as a proxy of its effect. The cases of rapidly developing cyclones over the northwest Pacific Ocean are divided into type A: ΔT> -2 (higher temperature/lower SST), type B: -4 <ΔT <-2, and type C: ΔT <-4 (lower temperature/higher SST). Composite analysis is carried out at cyclone center for each type. As any cyclones develop, it transformed into a comma shaped precipitation zone. Type A cyclones are accompanied by the north-south elongated precipitation distribution associated with warm zone in the east side of the cyclone center. Type C cyclones have the precipitation distribution spreading relatively circular around the center of cyclone. There is a greater difference between the 2 m temperature and the sea surface temperature on the northern side of the cyclones, so it is more affected by the surface. Type C cyclones tend to develop over the region of Kuroshio extension and their maximum development rates are small than other types. It is inferred that Type C cyclones are developed mainly by the latent heat flux from the sea surface rather than a large-scale baroclinicity on the atmosphere side.

