

Hioki, T., and K. Tsuboki, 2021: Trajectory Analyses on the warm core development and pressure falls of a developing typhoon as simulated by a cloud-resolving model. *J. Meteor. Soc. Japan*, **99**, <https://doi.org/10.2151/jmsj.2021-064>.

**Plain Language Summary:** The central pressure fall of a typhoon is associated with the development of the warm core in the eye and mass divergence of the eye. The purpose of this study is to examine (i) the origins and paths of the air comprising the warm core, and (ii) the paths followed by air leaving the eye in the troposphere. We performed trajectory analyses based on a high-resolution (2-km) numerical simulation of a developing typhoon Wipha (2007) using the cloud-resolving model CReSS.

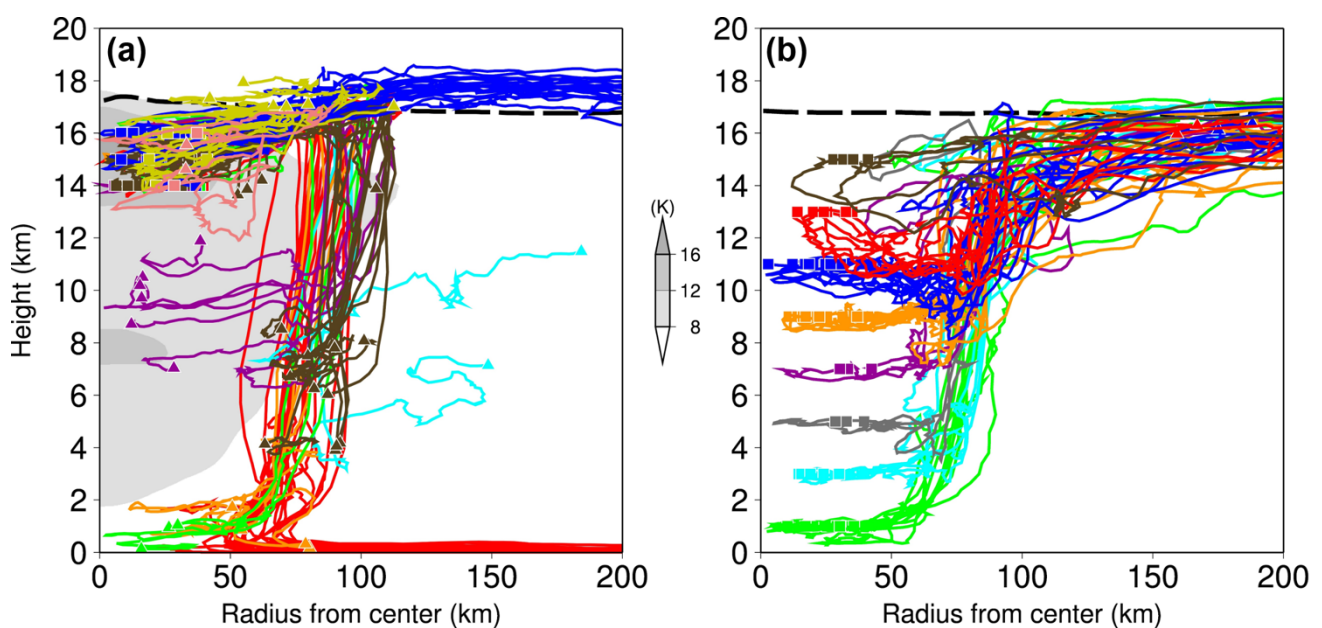


Figure 1. (a) Representative backward trajectories of air parcels in the warm core, and (b) representative forward trajectories of air parcels reaching the region outside of the eyewall in radius-height cross-section. Gray shading in (a) shows the azimuthally averaged potential temperature deviation (K) at 24 h. Squares indicate the starting points for the trajectories and triangles indicate the end points.

- The results of backward trajectories calculated from the eye show that the air parcels comprising the upper-level warm core originated from the lower troposphere and the lower stratosphere.
- The results of forward trajectories calculated from the eye that air parcels leave the eye through the eyewall throughout the troposphere, particularly at heights below 2 km and between 9 and 12 km, which ultimately results in a central pressure fall.