How do high-frequency oscillations of tropical cyclones vary across the W North Pacific?

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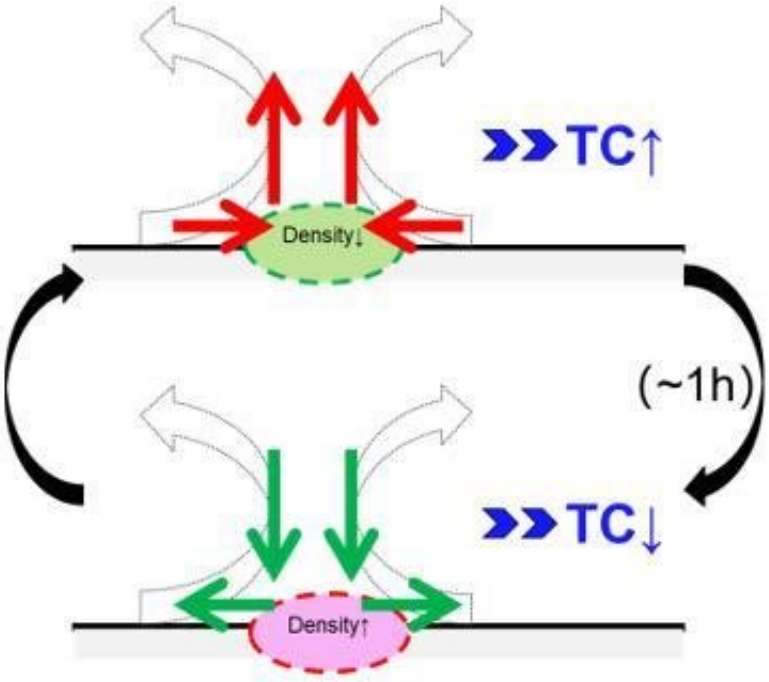

High-frequency oscillations and intensity of tropical cyclones. Credit: Shumin CHEN

High-frequency oscillations, with a period of approximately two hours, generally occur within the eyewall of tropical cyclones. These oscillations in turn induce oscillations of the tropical cyclone intensity through the oscillation of convection.

Associate Researcher Shumin CHEN, Professor Weibiao LI and their team from Sun Yat-Sen University simulated several tropical cyclones using mesoscale numerical models. As detailed in their paper, recently published in *Advances in Atmospheric Sciences*, they found that periods of high-frequency oscillations of tropical cyclones in the South China Sea are significantly shorter than those in the open water of the western North Pacific.

They further examined the dynamic and thermodynamic characteristics of all the tropical cyclones. Associate Researcher Shumin CHEN explains their findings:

"We examined the environmental vorticity, divergence, thermal winds, and the convergence winds in the lower layer. We found that the general features were similar in tropical cyclones in the South China Sea and the open western North Pacific, except that the convergence within the lower layer of tropical cyclones in the South China Sea was significantly larger than that in the open western North Pacific. Convergence enhanced by greater terrain friction in the South China Sea strengthened the disturbance and then contributed to the shorter oscillation periods".

Professor Weibiao LI further explains that the study reveals the variations of high-frequency oscillation over different sea areas, and helps to improve the prediction of tropical cyclone intensity in different sea areas over the western North Pacific.

More information: Shumin Chen et al, Variations in High-frequency Oscillations of Tropical Cyclones over the Western North Pacific, *Advances in Atmospheric Sciences* (2018). DOI: 10.1007/s00376-017-7060-z