

Instabilities in Ekman layer and roll structures in a tropical cyclone boundary layer

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Taking advantage of the huge computational power of a massive parallel supercomputer (K-supercomputer), a large eddy simulation of entire tropical cyclones by use of a numerical weather prediction model was conducted. In the numerical results, three kinds of roll structures are found in the boundary layer (See figure; Ito et al., 2017). An analysis of linear instabilities in Ekman layer suggests that the mechanisms to form the rolls are associated with two kinds of growth modes (inflection point and parallel instabilities) of the Ekman layer.

Keywords: Tropical cyclone boundary layer, Roll structure, Linear Instability, Ekman Layer

