A source–sink vortex as a hydrodynamic model of tropical cyclone

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Received 25-JUL-92

Using a simple two-layer model in a rotating fluid it is explained why the surface depression in a tropical cyclone takes place even though the air mass converges near the vortex centre and accumulates over the cyclonic vortex due to geostrophic adjustment. It is shown that an anticyclonic vortex of warm air released from the centre of a tropical cycle penetrates into the stratosphere. Due to isostacy, part of the air mass in the stratosphere escapes from the cyclonic region so that the depression at the surface takes place. Because of this process the tropical cyclone behaves like a sink vortex.

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