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Cold-cored tropical cyclone[1] LIN LI, PINAKI CHAKRABORTY, Okinawa Inst of Sci Tech — A tropical cyclone is a warm-cored storm. The warm core powers its intense winds. Upon landfall, the warm core decays, and consequently, so do the attendant winds. This fortunate occurrence limits the destruction largely to the coastal region near landfall. Unfortunately, however, some landfalling tropical cyclones transition to extratropical cyclones. Powered by a baroclinically-unstable environment, an extratropical cyclone can reintensify and inflict substantial damage thousands of kilometers inland. Thus, accurate forecasting of whether or not a tropical cyclone will transition to an extratropical cyclone carries immense consequences. To objectively identify the completion of the transition, the prevailing forecasting methods invoke a telltale signature: the birth of a cold core in the lower troposphere. We show computationally and argue theoretically that a landfalling tropical cyclone engenders such a cold core purely from internal dynamics without any recourse to an external, unstable environment. That is, a "cold-cored tropical cyclone" is but the natural state of a tropical cyclone past landfall.

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Lin Li
Okinawa Inst of Sci
Tech

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