The Tropical Cyclone Diurnal Cycle

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New GOES infrared satellite imagery has been developed to continuously monitor changes in the cloud top convective and cirrus canopy structure of tropical cyclones. This satellite imagery has also revealed a curious diurnal pulsing pattern that may represent an unrealized, yet fundamental process of mature tropical cyclones. These diurnal pulses appear as IR “cold rings” in the satellite imagery. They begin forming in the storm's inner core at sunset each day and steadily move/propagate away from the storm overnight, reaching areas several hundred kilometers from the TC center by the following afternoon. There appear to be marked structural changes to storms and their upper-level outflow patterns as diurnal pulses develop and evolve each day. The timing and propagation of these pulses also appear to be linked to the diurnal cycle, making them remarkably predictable in time and space.