Temple University Mathematics Colloquium

Esteban Tabak

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will speak on

The Diurnal Cycle and the Meridional Extent of the Tropics

ABSTRACT: This talk proposes an explanation for the sharp transition between tropics and extra-tropics at a latitude of 30 degrees. This transition, at the outer edges of the Hadley cells, is marked by a steep jump in the height of the troposphere, from sixteen kilometers in the tropics to nine in the mid and high latitudes. The tropics, equatorwards of 30 degrees, are characterized by easterly surface winds -the Trades- and a strong diurnal signal in the wind. Polewards of 30 degrees, the winds are westerly and the weather systems have longer spatio-temporal scales.

This change of behavior can be explained in terms of diurnal baroclinic waves, due to solar forcing and trapped equatorwards of 30 degrees by the Coriolis effect. Their effect can be illustrated in simple two-layer models for the meridional circulation, where convection is represented by non-conventional conservations laws that preserve energy instead of mass.

Monday, October 1, 2012
Lecture at 4:00 pm
Coffee, tea, and refreshments from 3:40 pm
Room 617, Wachman Building
Department of Mathematics