# RAL/MMM JOINT SEMINAR
## DISTINGUISHED SPEAKER SERIES

# *Slow Modes of the Equatorial Waveguide*


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I will present a linear model of the equatorial waveguide based on the assumptions of hydrostatic balance and a temperature profile that remains moist adiabatic at all times. As has been shown before, these assumptions reduce the primitive equations to the mathematical form of shallow water equations of the kind first explored by Matsuno. Some of the classical Matsuno modes are destabilized in this model by cloud-radiation and/or wind-surface-heat-flux feedbacks (WISHE); no instability arises purely from the interaction of convection with circulation.

Based on this and previous published work, I will argue that convectively coupled Kelvin waves are amplified WISHE while eastward propagating disturbances of nearly constant, low frequency are driven mostly by cloud-radiation feedback but driven eastward by WISHE. In addition, mixed-Rossby-gravity waves and equatorial Rossby waves can be destabilized and propagated by WISHE and/or cloud-radiation feedback. These feedbacks can be strong enough to drive the modes substantially far away from the Matsuno dispersion curves, calling for alternative descriptions of their physics.


**Thursday, 29 August 2019, 3:30pm**

**Refreshments 3:15pm**

NCAR-Foothills Laboratory, 3450 Mitchell Lane, FL2-1022, Large Auditorium

*This seminar will be webcast live at:*
*http://ucarconnect.ucar.edu/live*

*Recorded seminar link can be viewed here:*
*https://www.mmm.ucar.edu/events/seminars*