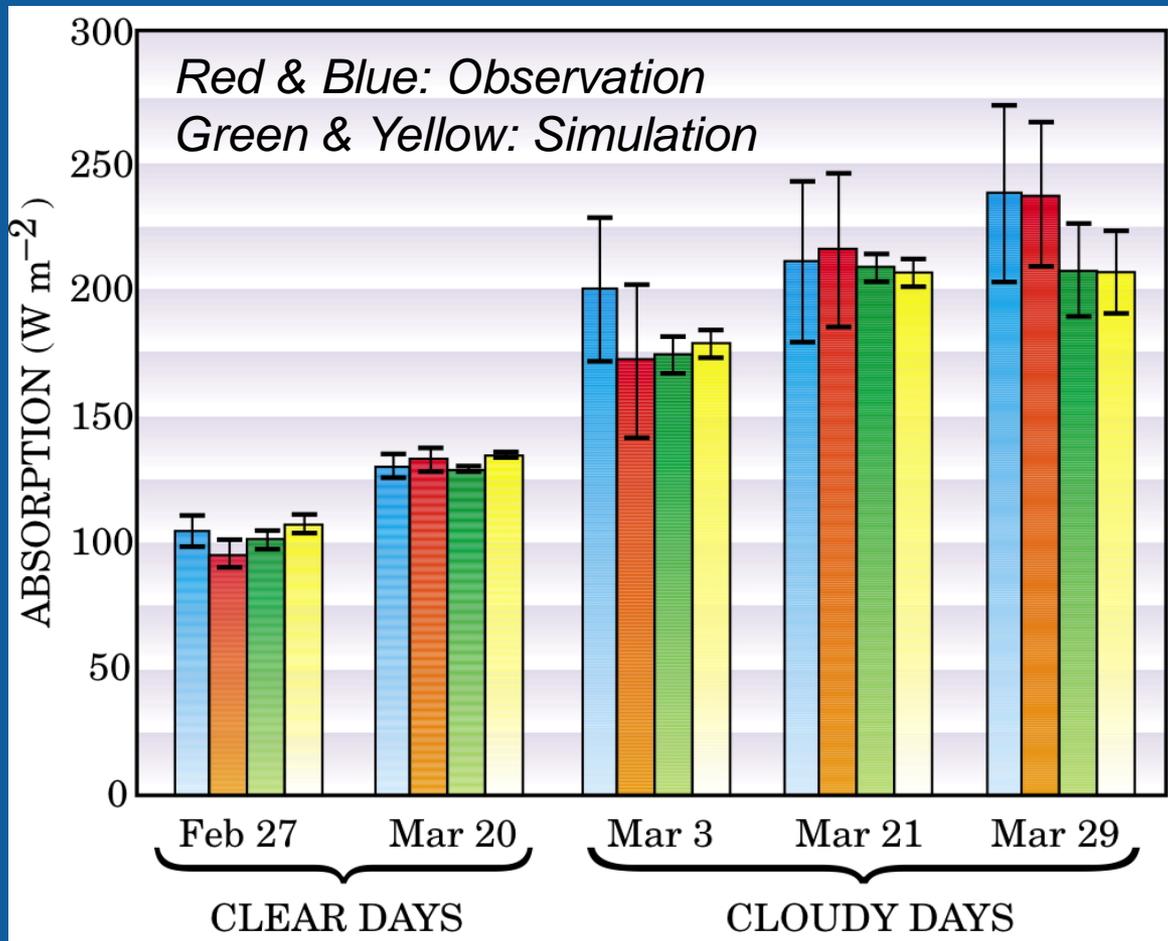


# Welcome to Spectral Radiation Closure Breakout Session

Christine, Sasha, Warren, Dave, Connor, Pavlos,  
Qilong, Sally and many colleagues

While shortwave radiation closure of a few  $\text{Wm}^{-2}$  has been achieved in clear-sky situations, closure in cloudy cases can fail by up to  $10\text{--}20 \text{ Wm}^{-2}$



- GCM radiation parameterizations suffer the same problem

Ackerman and Stokes (2003)

The study of broadband fluxes alone is not sufficient in terms of diagnosing problems in current GCM parameterizations or suggesting new ones

We need to test and validate detailed spectral models so they could form a proper springboard for GCM parameterization of spectral radiation



worked for longwave and RRTMG\_LW  
(Rapid Radiative Transfer Model for  
application to GCMs)



Spectral Radiation Closure Focus Group

# Agenda

- ARM shortwave spectral radiometers – Connor
- ARM scanning radars – Pavlos
- High-resolution oxygen A-band spectrometer – Qilong
- Surface albedo information – Sasha
- Status of surface albedo, RIPBE (radiatively important parameters best estimate) and BBHRP (broadband heating rate profile project) VAPs – Sally
- Discussions: scope, objectives, plan/activities, deliverables

# Need to define scope and objectives

- **Scope**
  - focus or broad sense? E.g., shortwave spectral closure or uses of shortwave spectral information (Sally)
- **Well-defined, focused science objectives**
  - identify what phenomena and what spectral regions are producing the discrepancies between observed and simulated downward shortwave spectral radiation
  - test and improve RRTMG\_SW for a range of cloudy cases
  - provide the best possible set of input parameters that can be used to achieve spectral radiation closure and surface flux prediction for all sky conditions

Need to have a plan/approach for using ARM data and coordinated efforts that lead to improvements in model representation of the specific focus area

- around spectral measurements
- around input parameters, e.g. providing water vapor, aerosol, 3D cloud and surface properties
- around 3D spectrally radiative transfer modeling (any suggestions from International comparison of 3D radiation Code?)
- select cases for testing (e.g. stratocumulus clouds, RACORO, future routine flights?)

# Need to obtain measurable and significant progress on a 5 year time scale

- spectral radiation closure to a few  $\text{Wm}^{-2}$
- RRTMG\_SW
- any metrics in GCM shortwave surface radiation closure?
- publications
- product

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- Name
- Email address
- Interest
- Thought/Comments