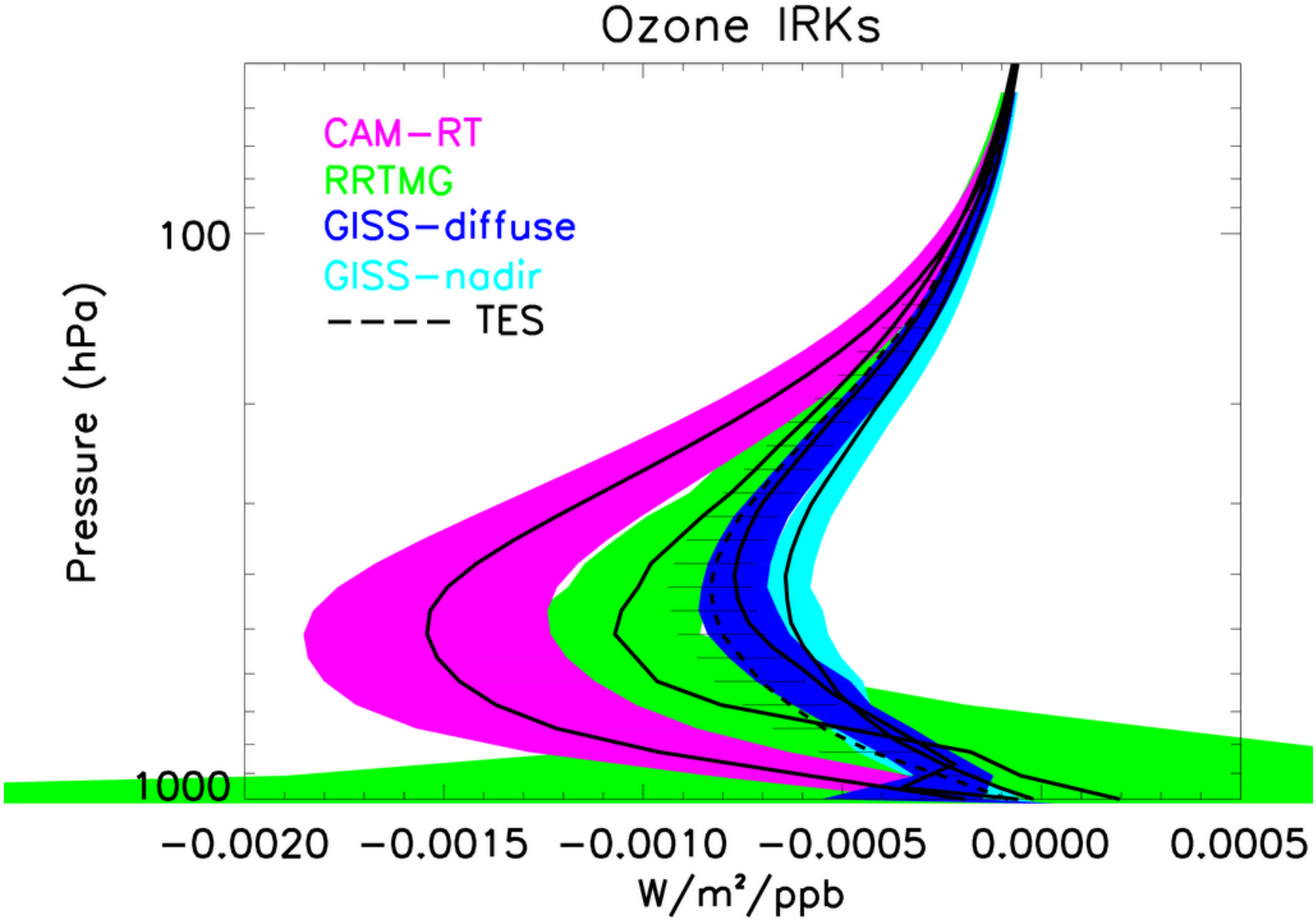
Comparison of 81 cloud-free ocean cases, models using TES atmosphere

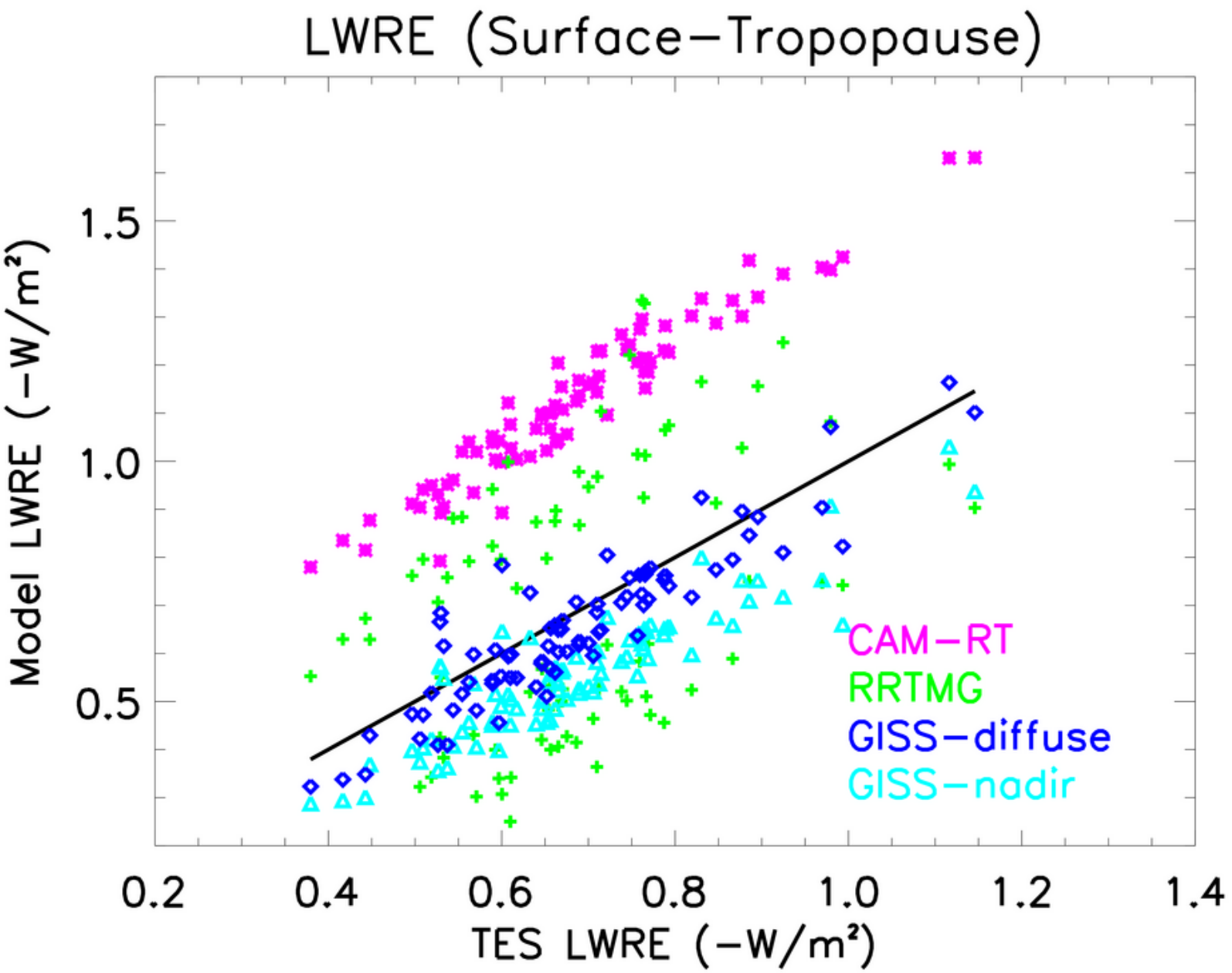
1) IRK = Instantaneous Radiative Kernel (W/m^2/ppb)

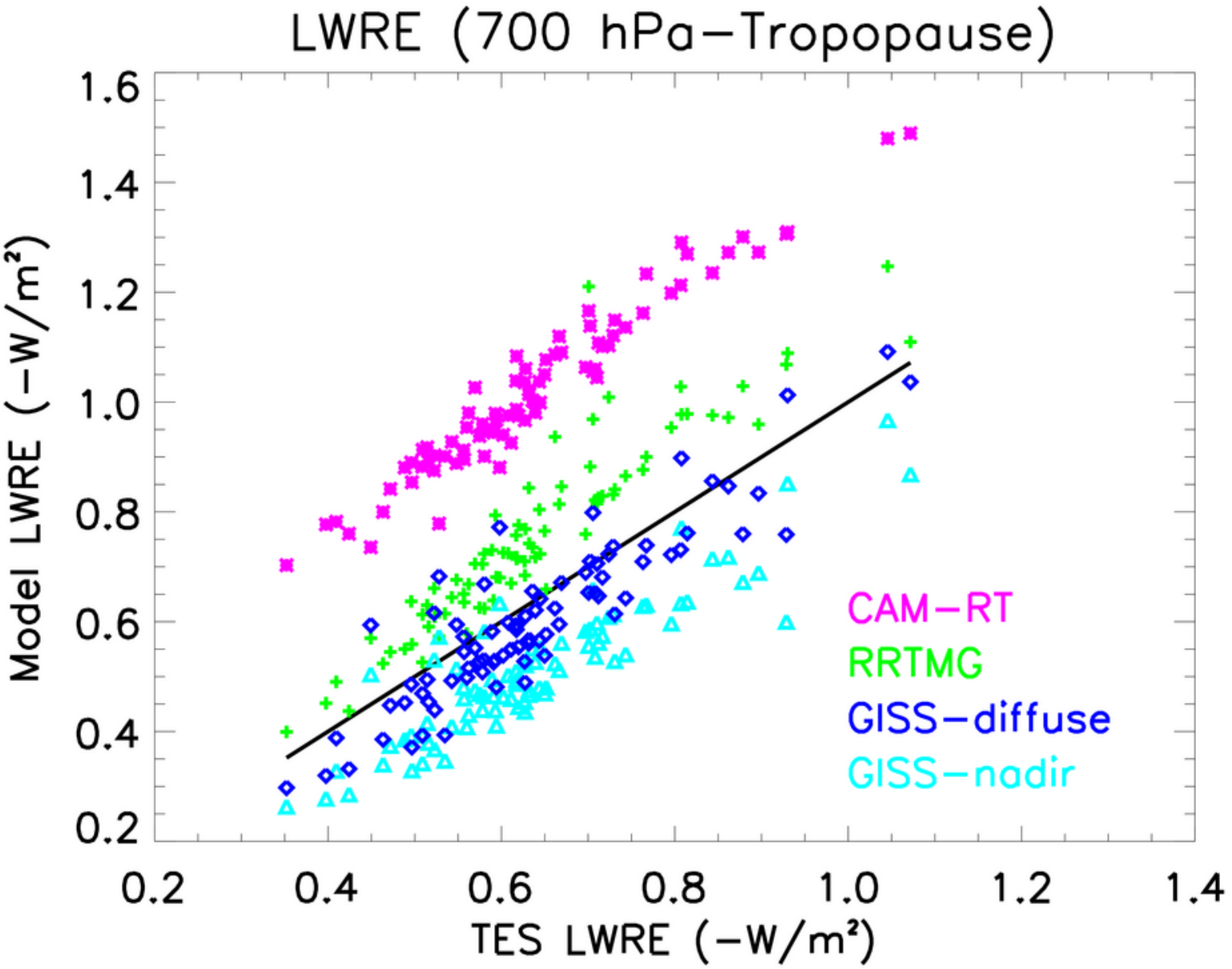
$$IRK = \frac{\partial F_{TOA}}{\partial q_l}$$

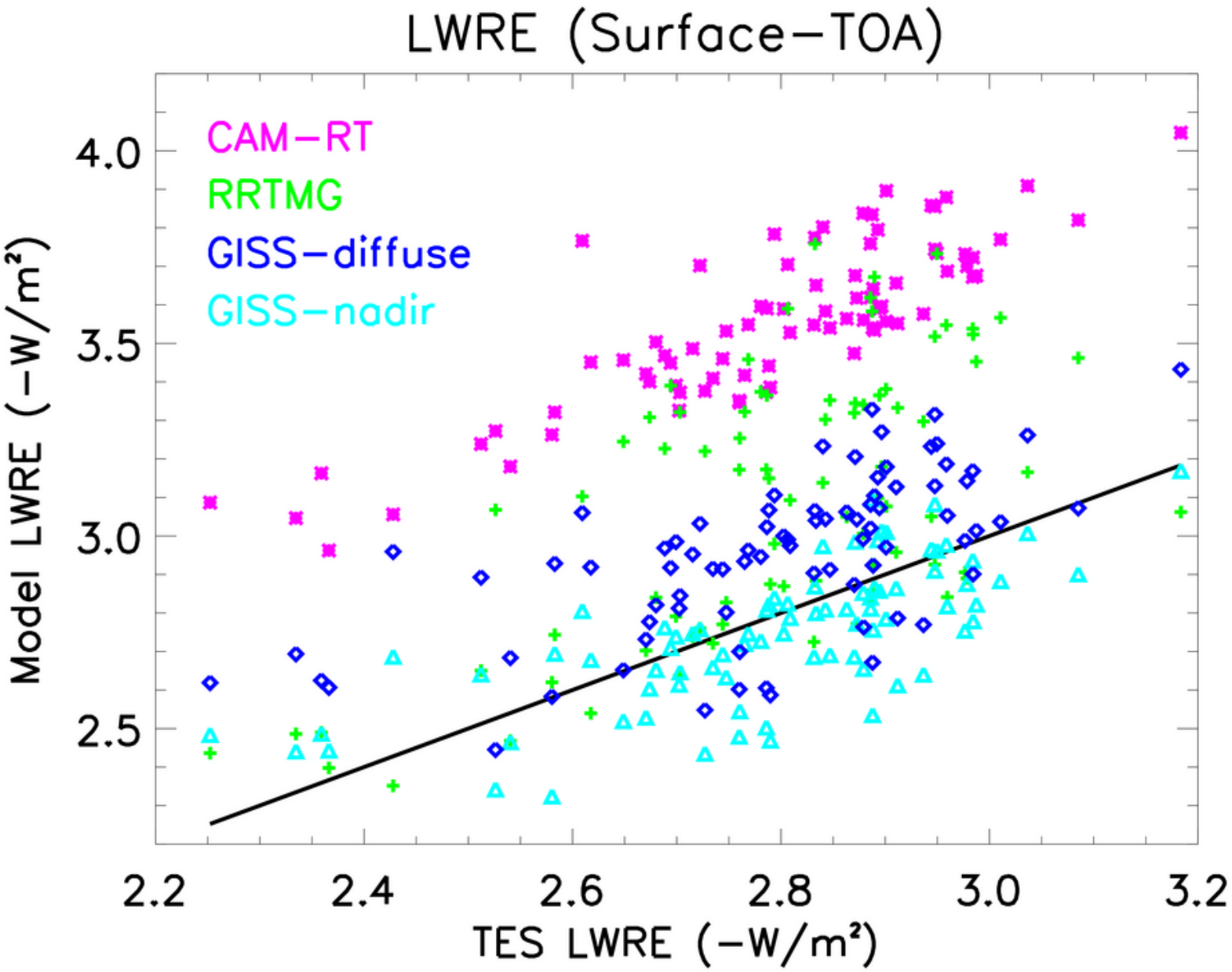
2) LWRE = Long Wave Radiative Efffect (W/m^2)

$$LWRE = \Delta F_{TOA} = \sum_{l=surface}^{tropopause} \left(\frac{\partial F_{TOA}}{\partial q_l} \right) q_l$$


Ozone IRKs
CAM−RT
RRTMG
GISS−diffuse
GISS−nadir
TES
Pressure (hPa)
100
1000
−0.0020
−0.0015
−0.0010
−0.0005
0.0000
0.0005
W/m²/ppb

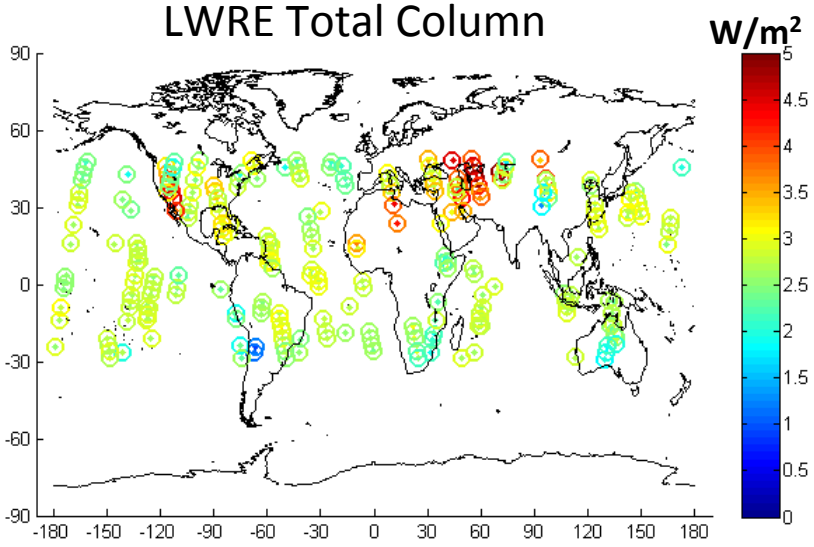

LWRE (Surface−Tropopause)
Model LWRE (−W/m²)
1.5
1.0
0.5
0.2
0.4
0.6
0.8
1.0
1.2
1.4
TES LWRE (−W/m²)
CAM−RT
RRTMG
GISS−diffuse
GISS−nadir

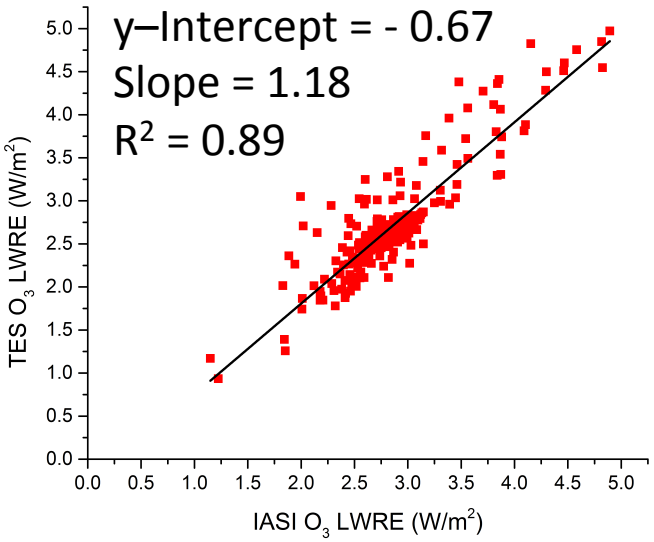

LWRE (700 hPa–Tropopause)
Model LWRE (–W/m²)
TES LWRE (–W/m²)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.2
0.4
0.6
0.8
1.0
1.2
1.4
CAM–RT
RRTMG
GISS–diffuse
GISS–nadir


LWRE (Surface−TOA)
CAM−RT
RRTMG
GISS−diffuse
GISS−nadir
Model LWRE (−W/m²)
4.0
3.5
3.0
2.5
2.2
2.4
2.6
2.8
3.0
3.2
TES LWRE (−W/m²)

O_3 LWRE – IASI and TES/Aura

LWRE Total Column



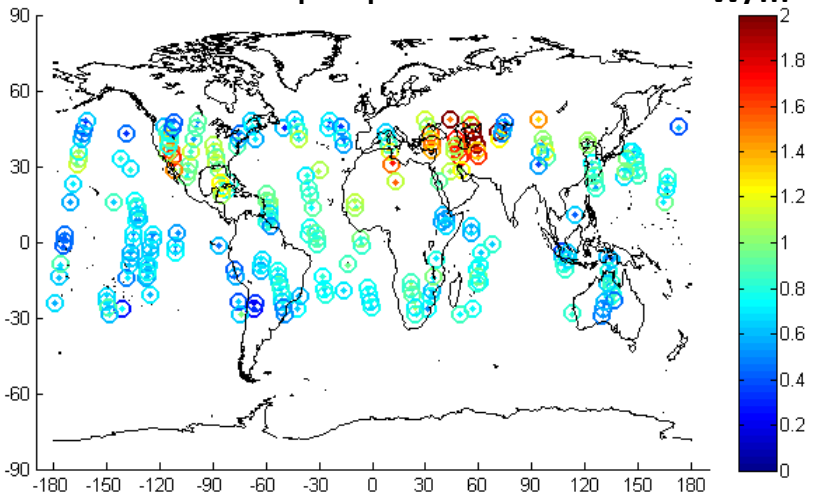


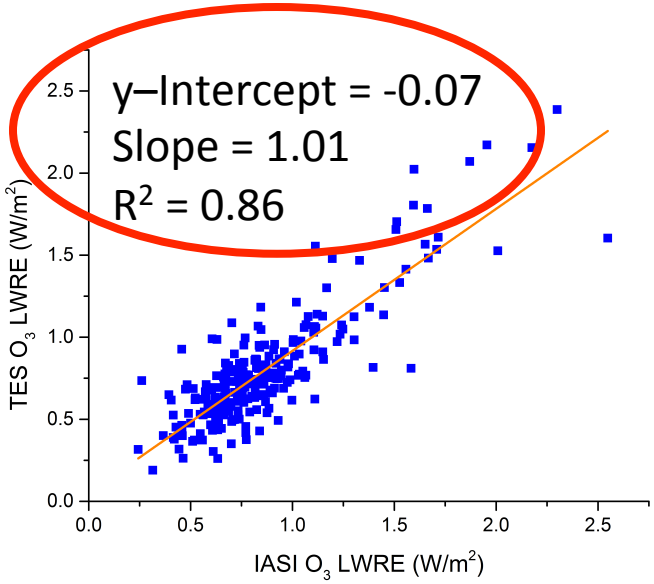
Direct Integration

15 July 2011

- **TES obs.**
- **IASI obs.**

LWRE Tropospheric Column





IASI=TES±0.5° lat
IASI=TES±0.5° lon

0 < TES–IASI < 6h