

Third Diffuse IOP Planning

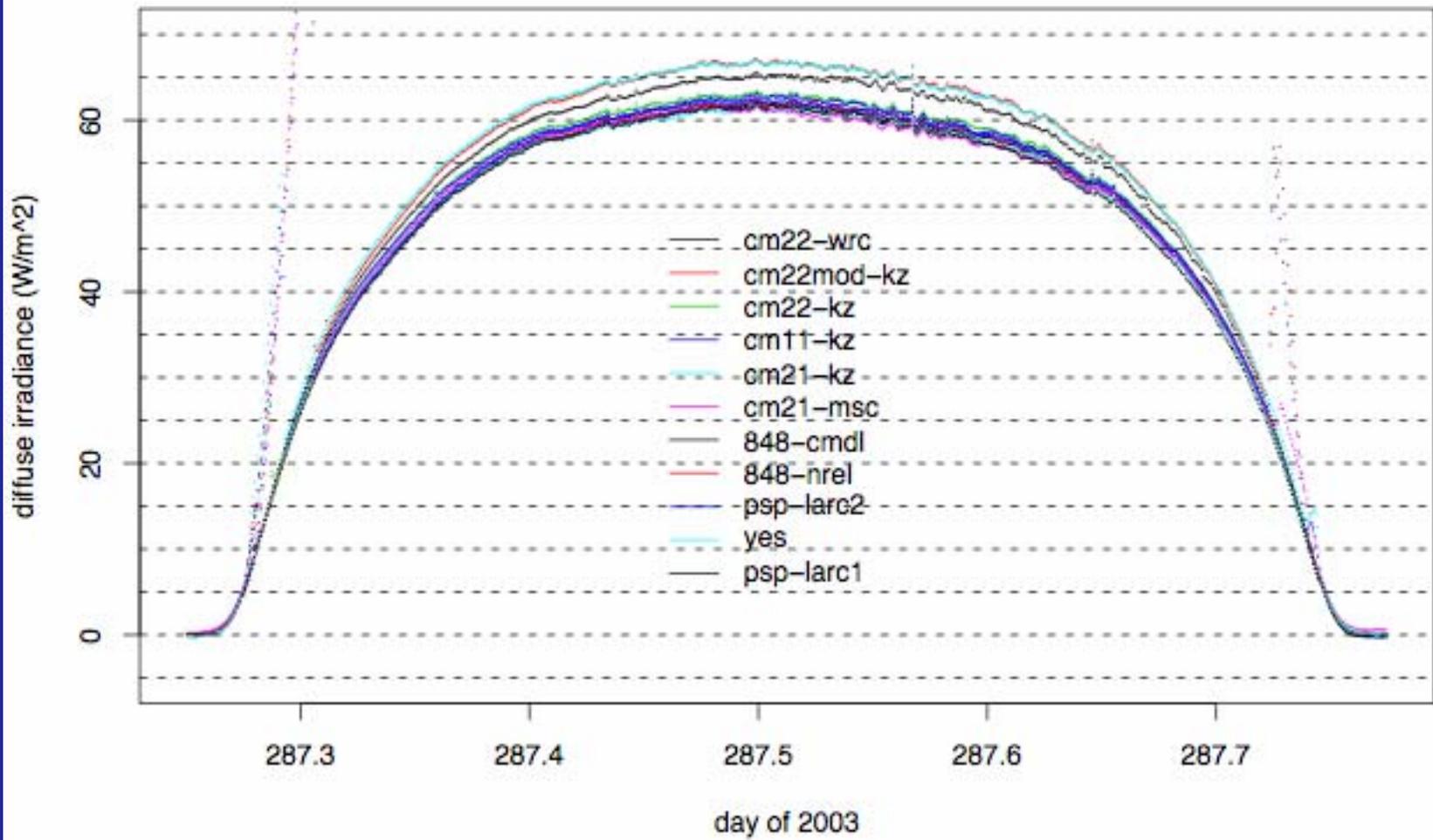
RCF @ SGP Central Facility

October 10-20, 2006

What and Why of IOP

- **What:** Simultaneous measurement of diffuse shortwave for clear and overcast skies using best instruments from two previous IOP's
- **Goal:** Select pyranometers that perform well in this IOP to establish the ARM working standard
- **Why:** Diffuse SW irradiance has no absolute measurement, but we can establish a working standard to use for RT model validation & instrument calibration that is tied to the absolute cavity

With ARM-type Pyranometers Added



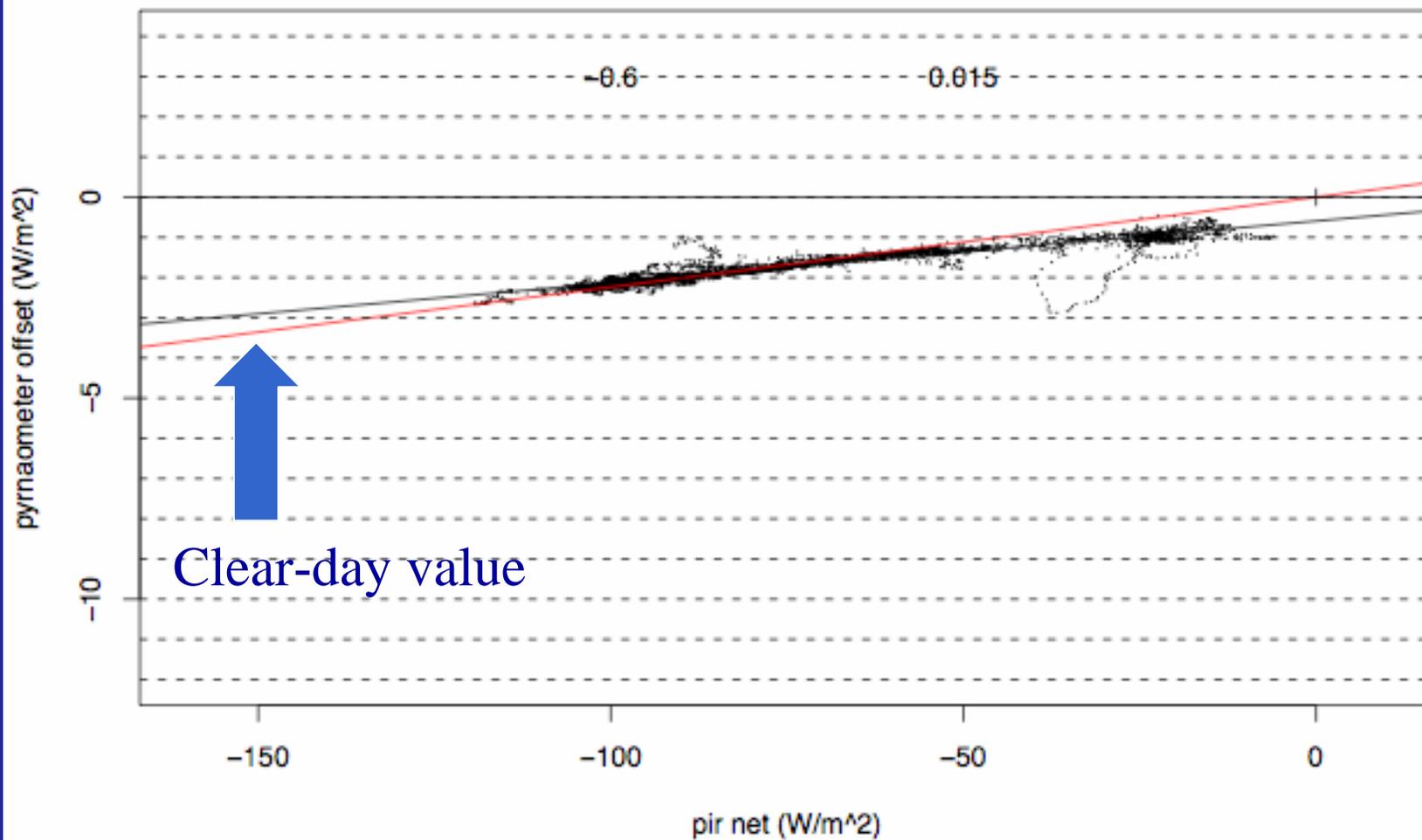
Calibration

- Shade/unshade calibration using absolute measurement of direct (ACR) will be performed during IOP if possible
- Picking optimum time of year to conduct experiment for calibration
- May need to default to current calibrations and calibrate instruments at a later time

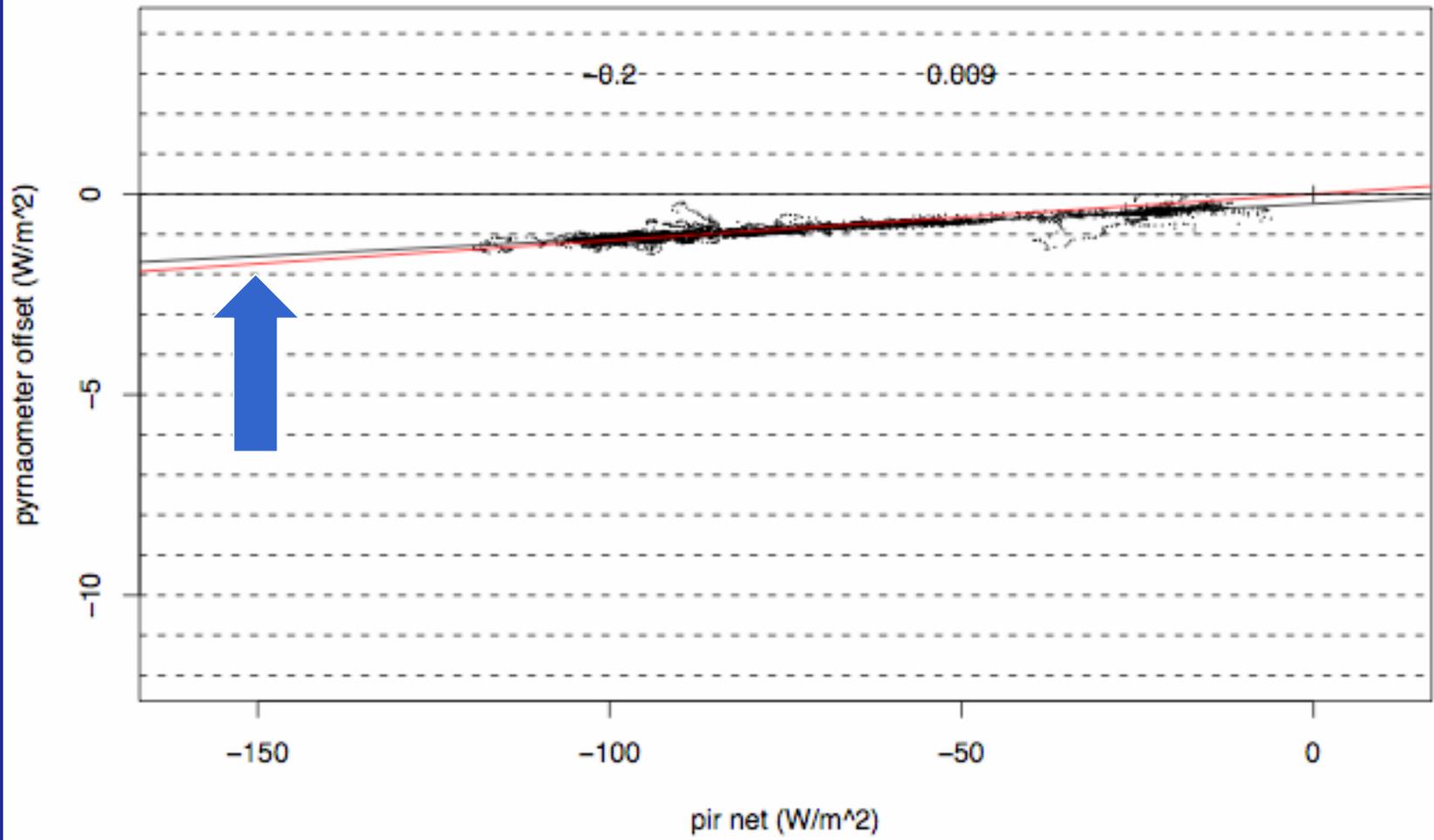
Needed Corrections

- Offset (measure during IOP)
- Blocking geometry
- Cosine response to diffuse
- Spectral correction

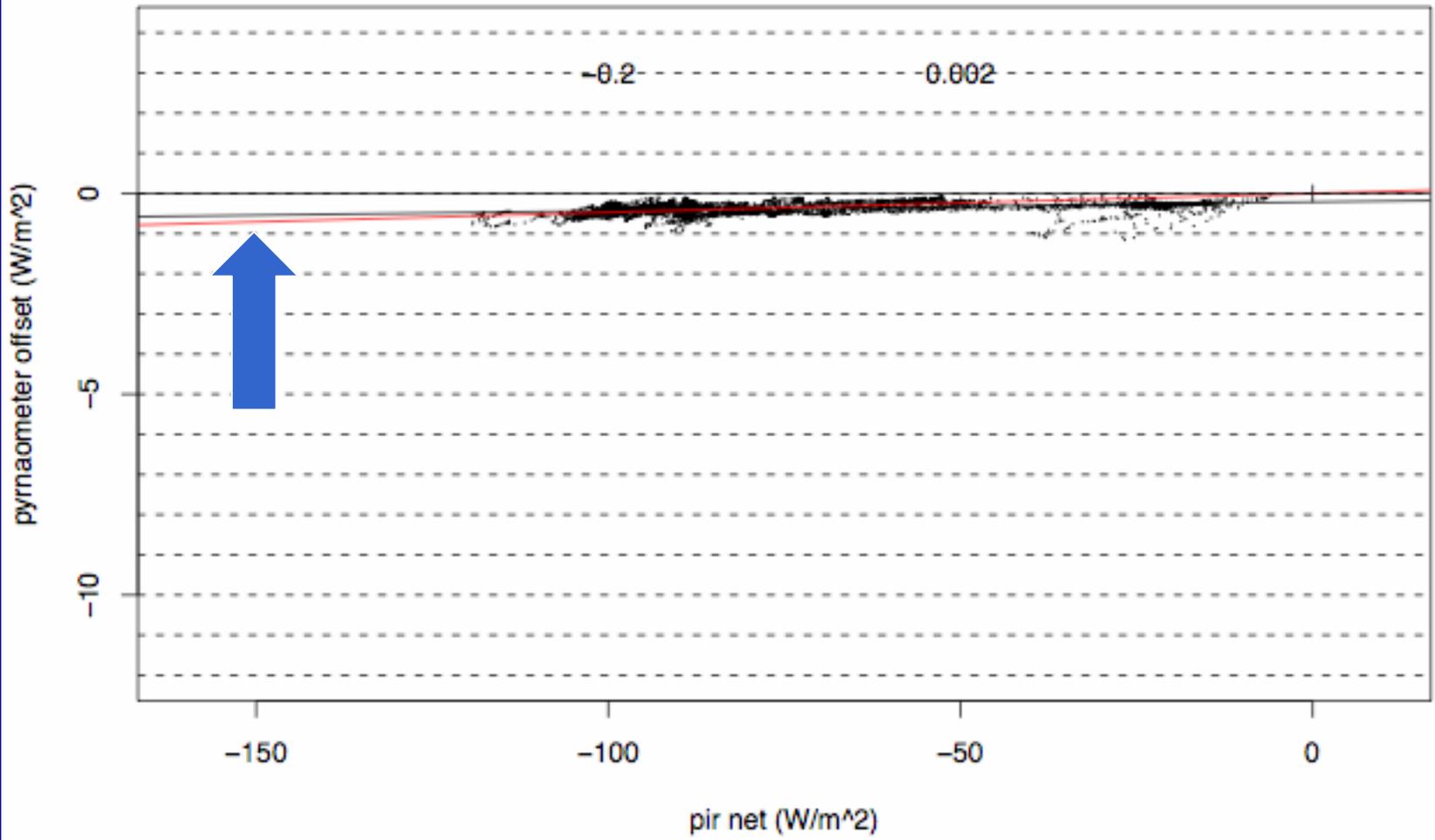
cm11-kz



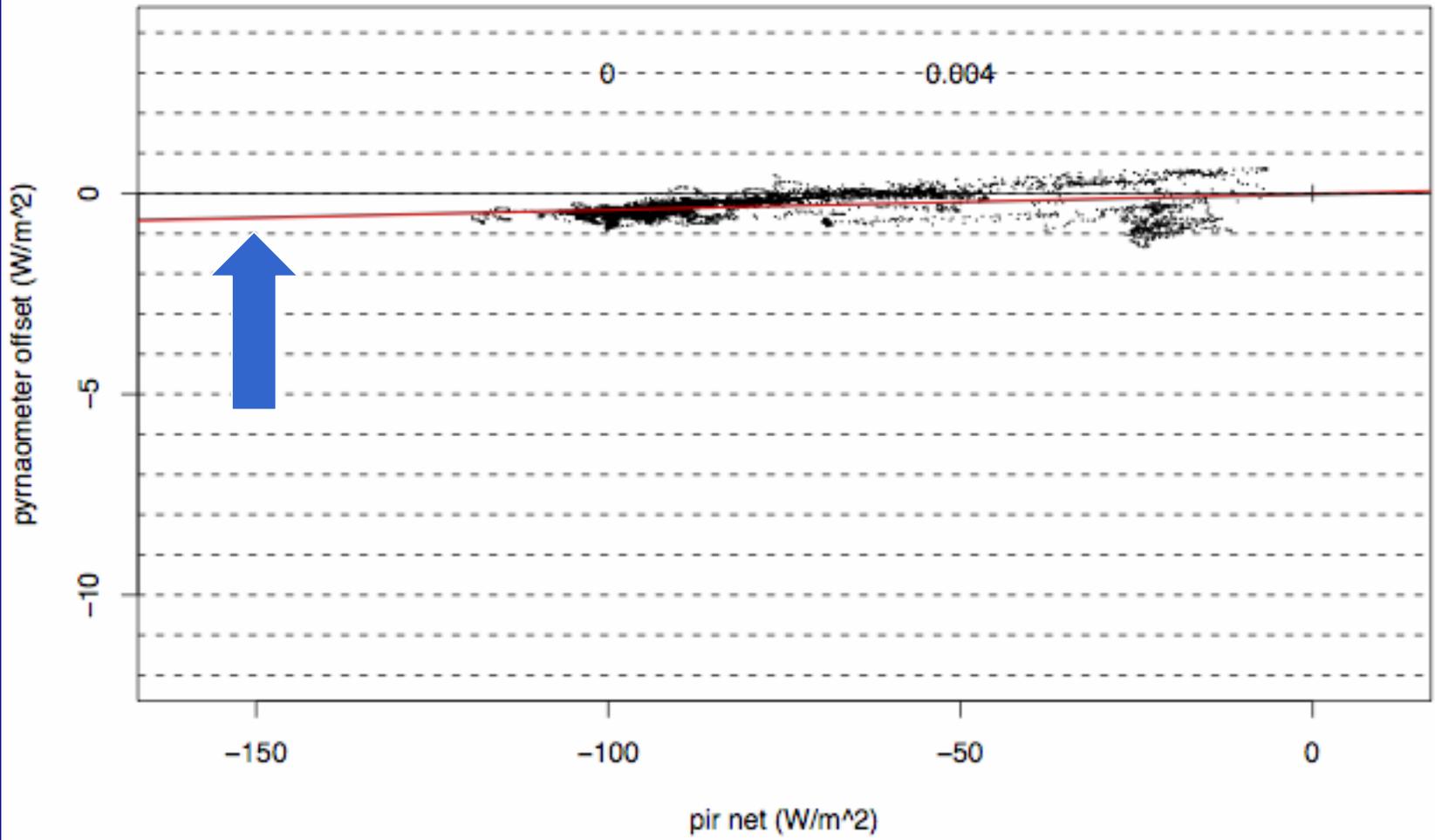
cm22-kz



848-cmdl



cm22-wrc



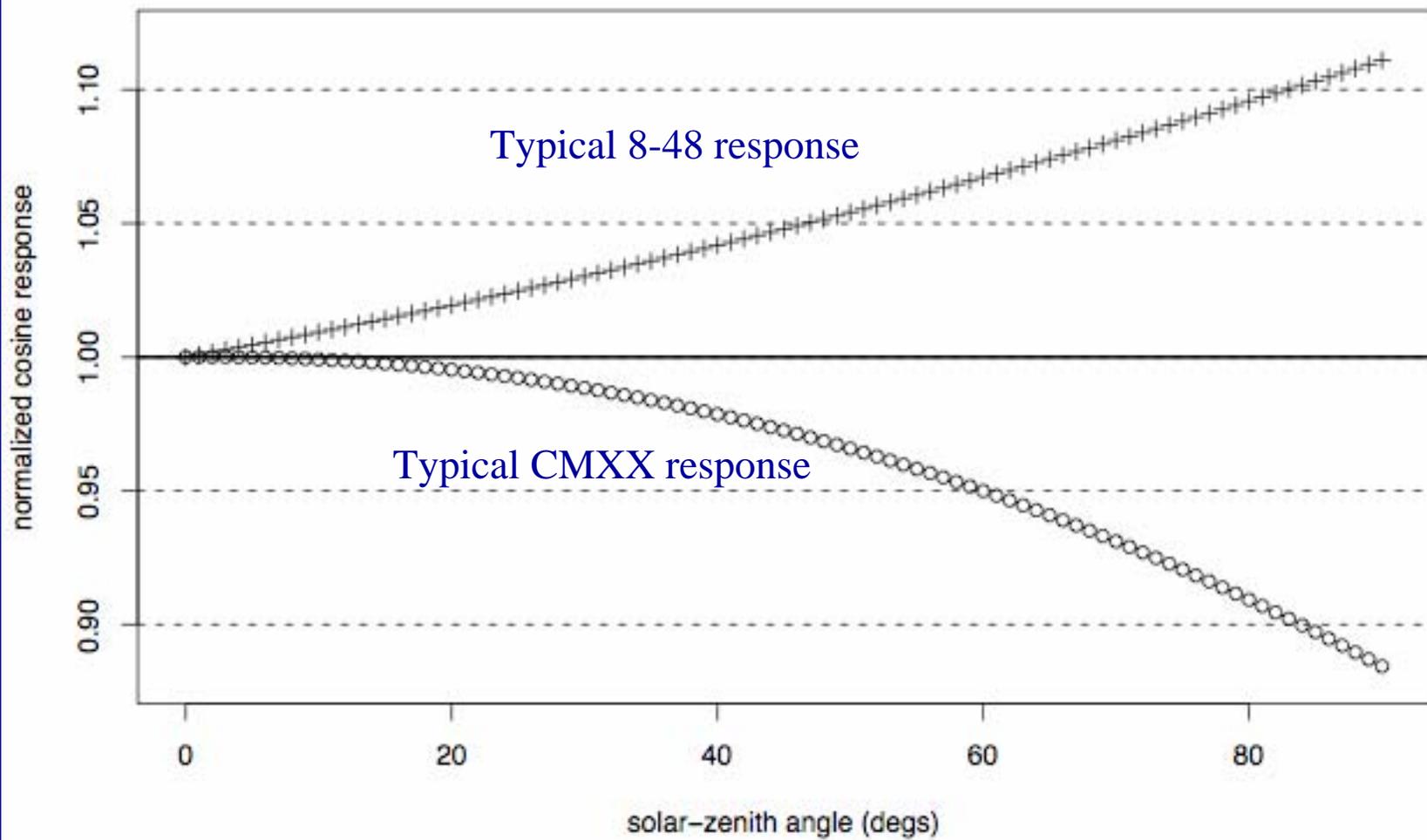
Needed Corrections

- Offset
- **Blocking geometry correction (same for all)**
- Cosine response to diffuse
- Spectral correction



Needed Corrections

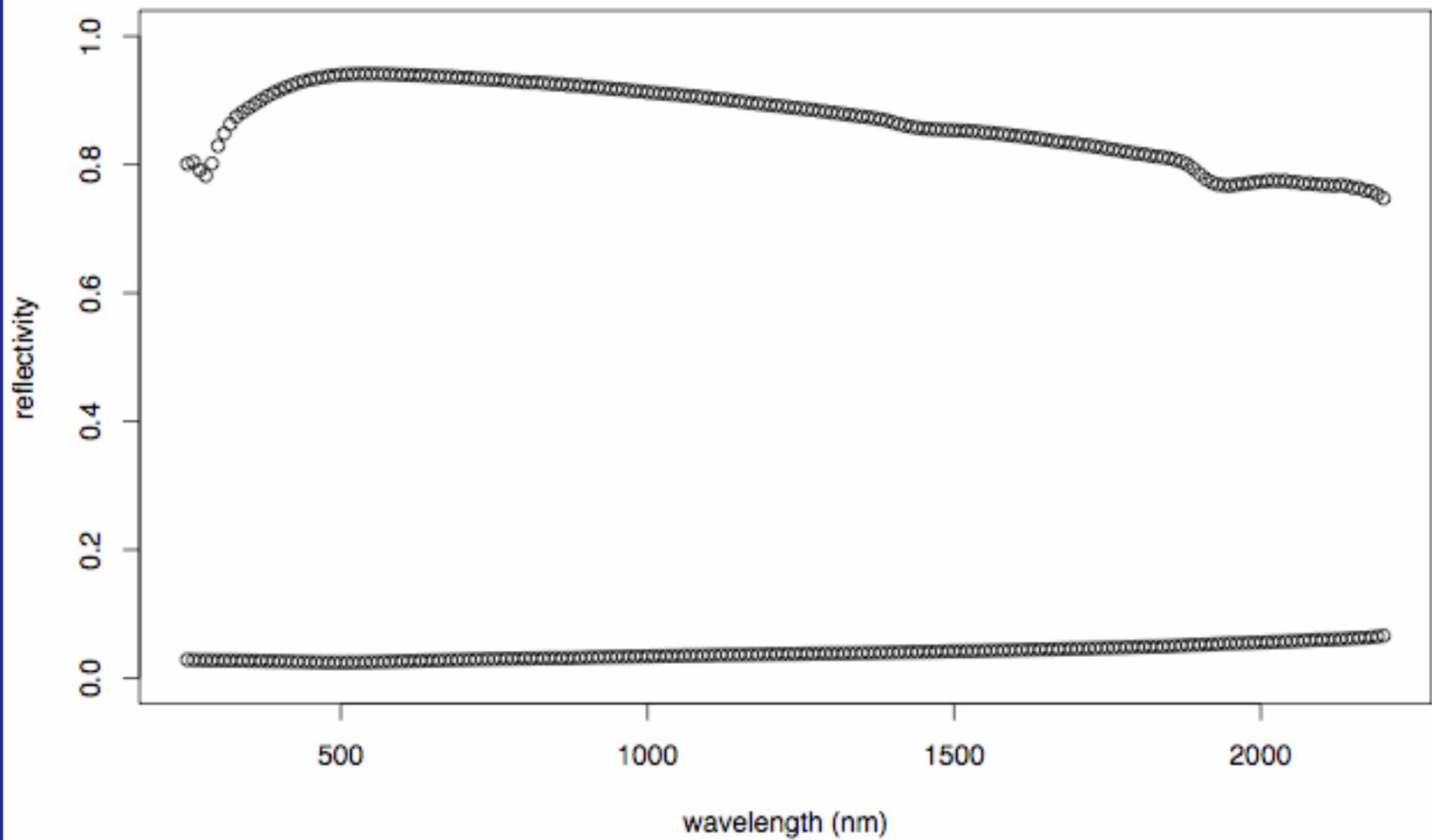
- Offset
- Blocking geometry correction
- **Cosine response to diffuse** (Bruce McArthur at Met. Ser. of Canada will measure)
- Spectral correction



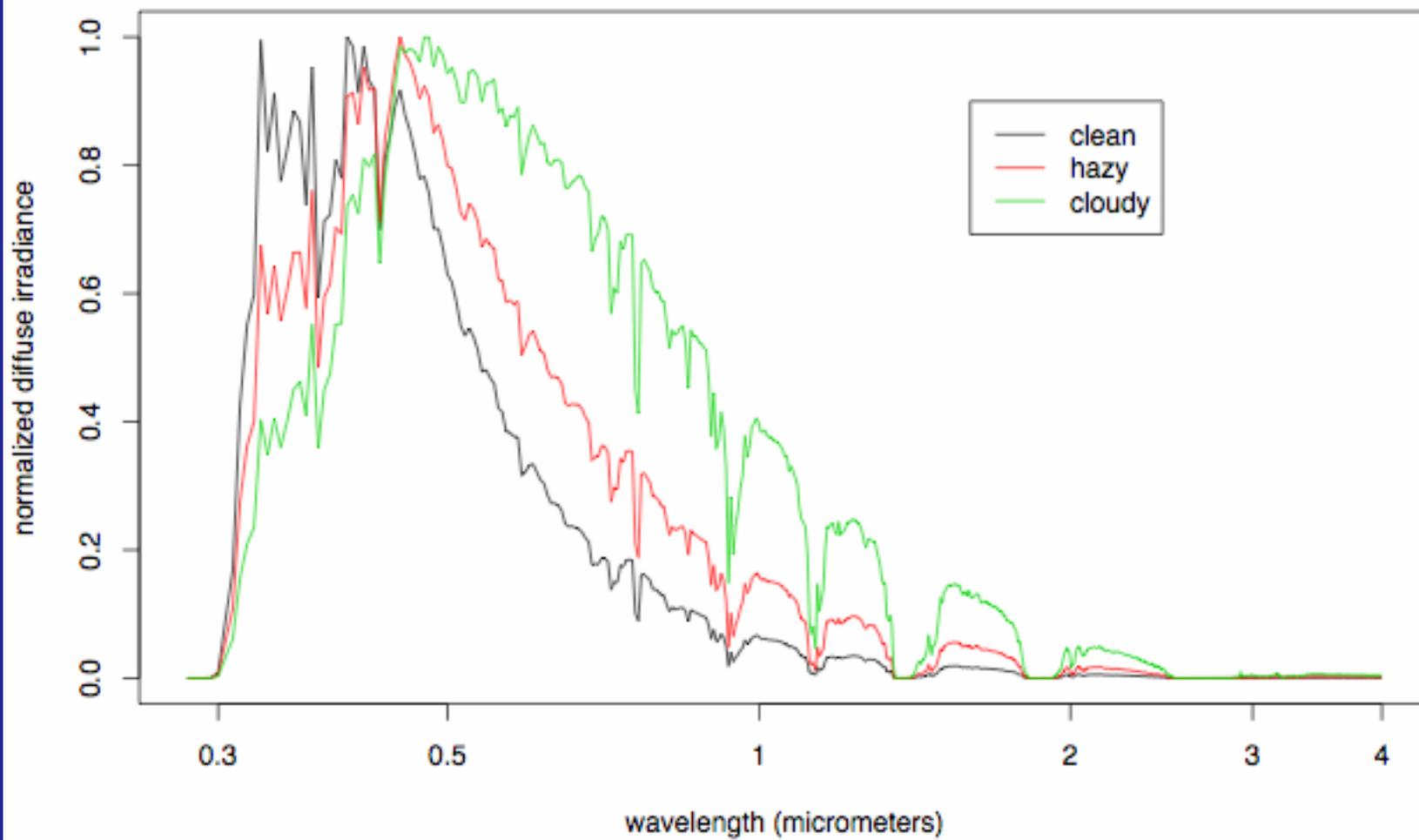
Needed Corrections

- Offset
- Blocking geometry correction
- Cosine response to diffuse
- Spectral (Measure reflectivity @ NRC)

Black & White Reflectivity of Eppley 34580



Spectral Shift in Diffuse Irradiance with Sky Type



Candidate Instruments

- Eppley 8-48 (new one)
- Kipp & Zonen CM11 (new one)
- Philipona's CM22 (best performer in two prior diffuse IOP's)
- ARM's CM22 (gift from Kipp&Zonen)
- Need a PIR for offset correction

Diffuse Radiometer Performance Relative to Mean of Stable Eleven (Wm^{-2})

