

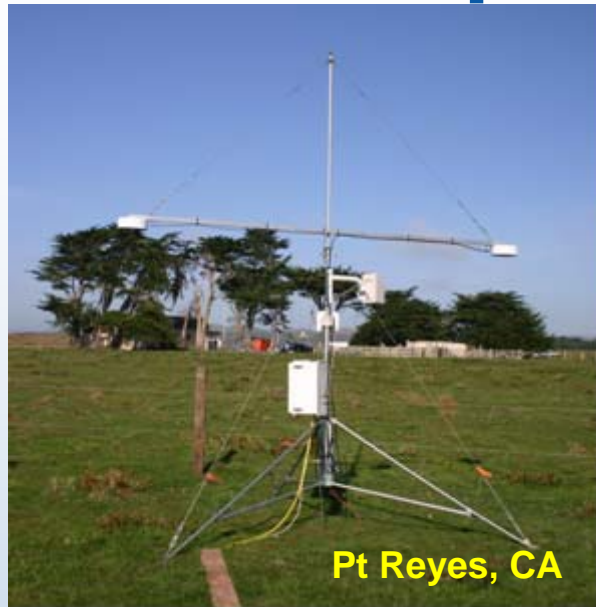
AMF/GNDRAD Reconfiguration: *Moving the White CoolCell*

ARM Radiative Processes Working Group

Analyses by Mary Anderberg & Tom Stoffel

March 10, 2008

ACRF Upwelling Irradiances



Infrared UIR
Shortwave US



AMF Upwelling Irradiances



Warren et al. visits FKB...

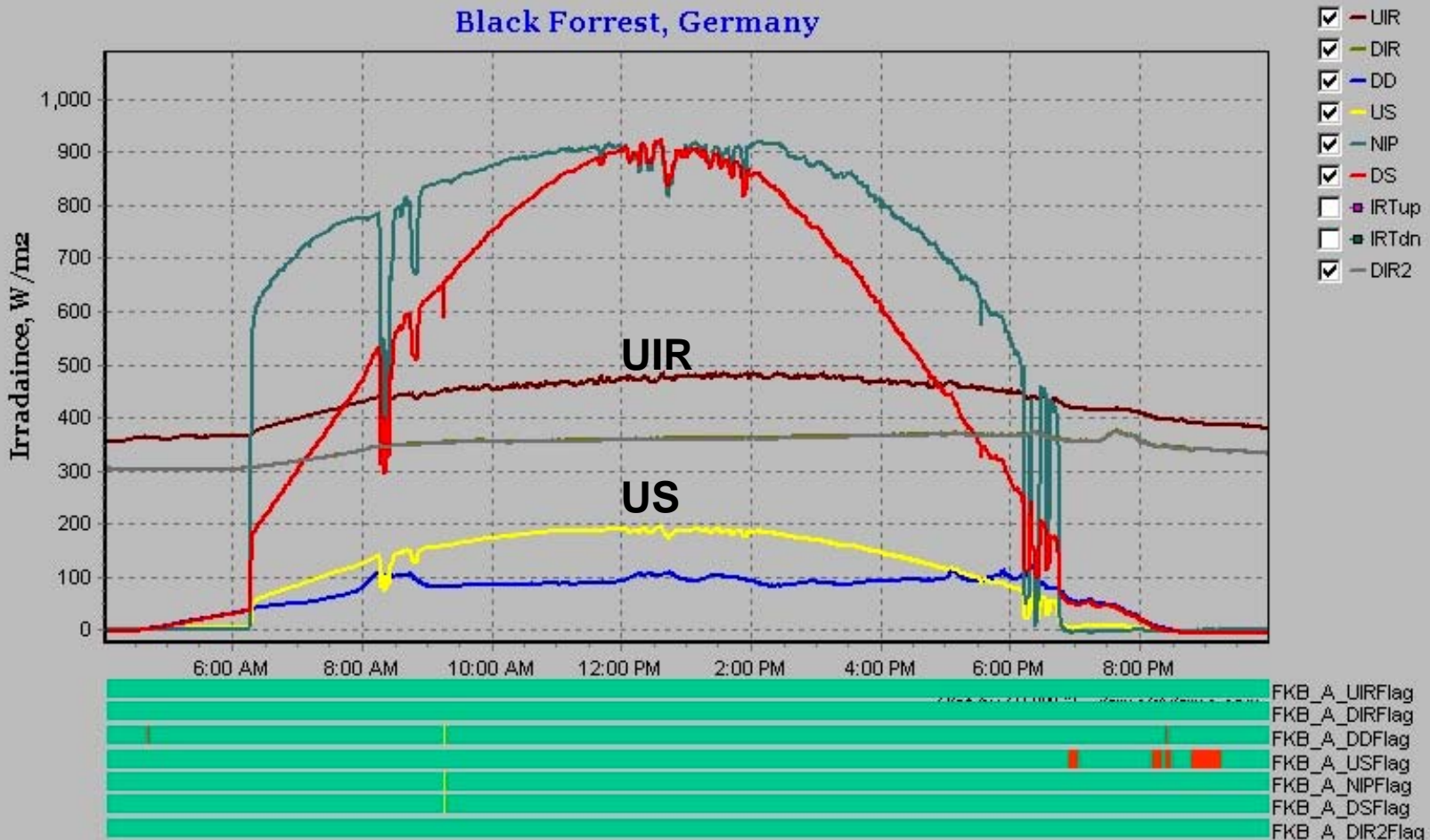


BCR 01402: Move 7 m before on 10 m Tower

AMF Upwelling Irradiances

ARM Mobile Facility
Black Forrest, Germany

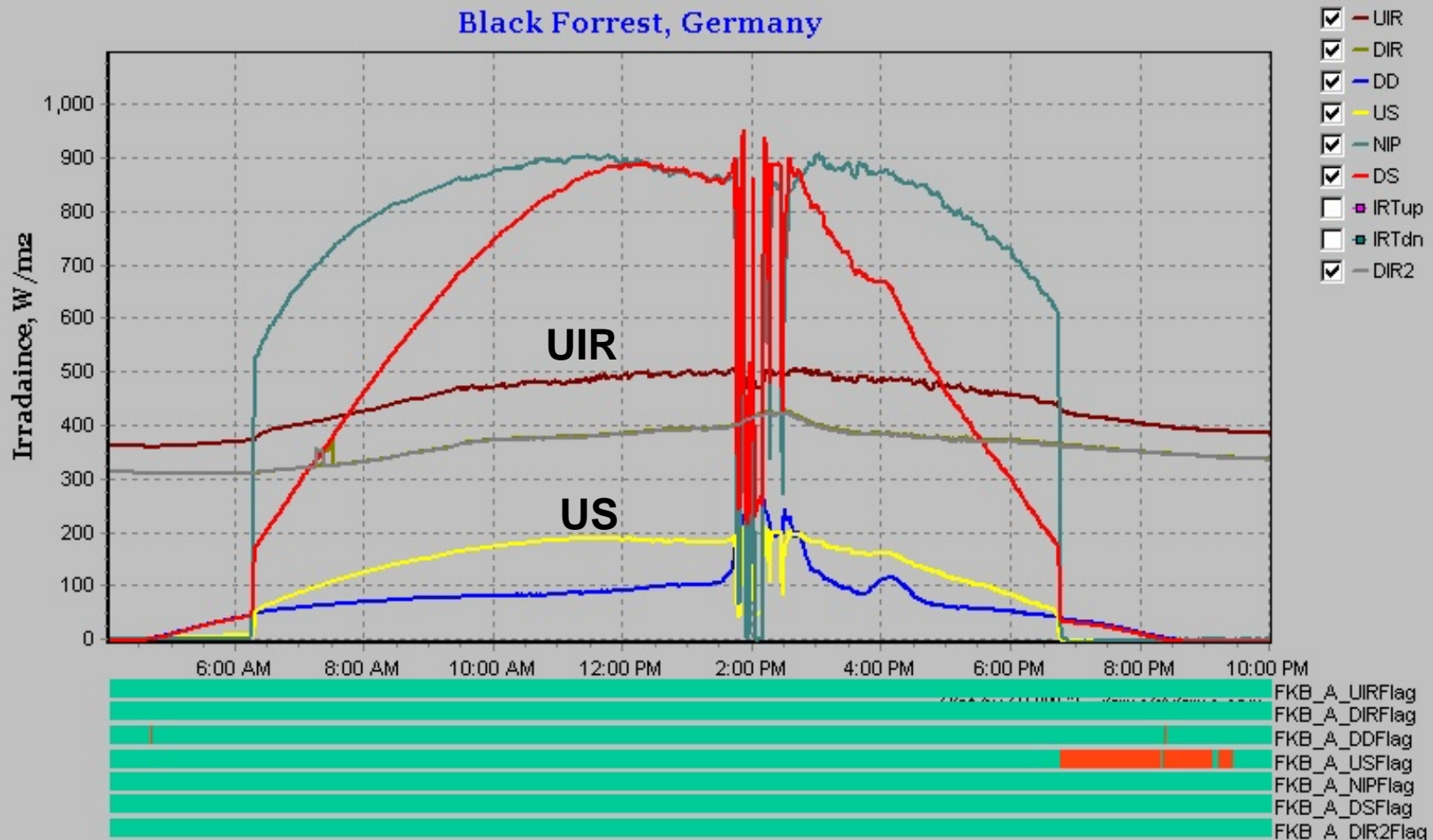
July 14, 2007



AMF Upwelling Irradiances

ARM Mobile Facility
Black Forrest, Germany

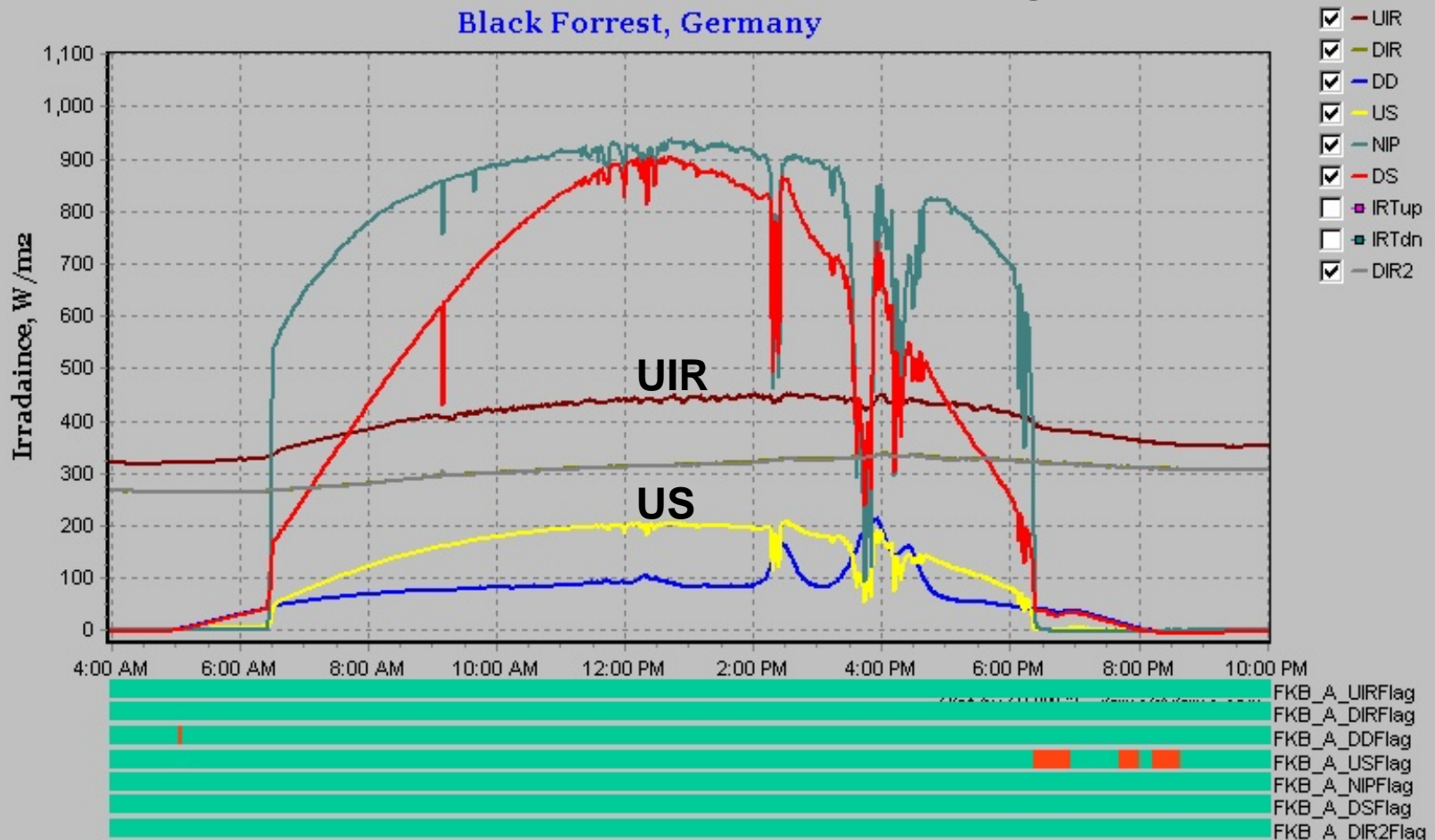
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AMF Upwelling Irradiances

ARM Mobile Facility
Black Forrest, Germany

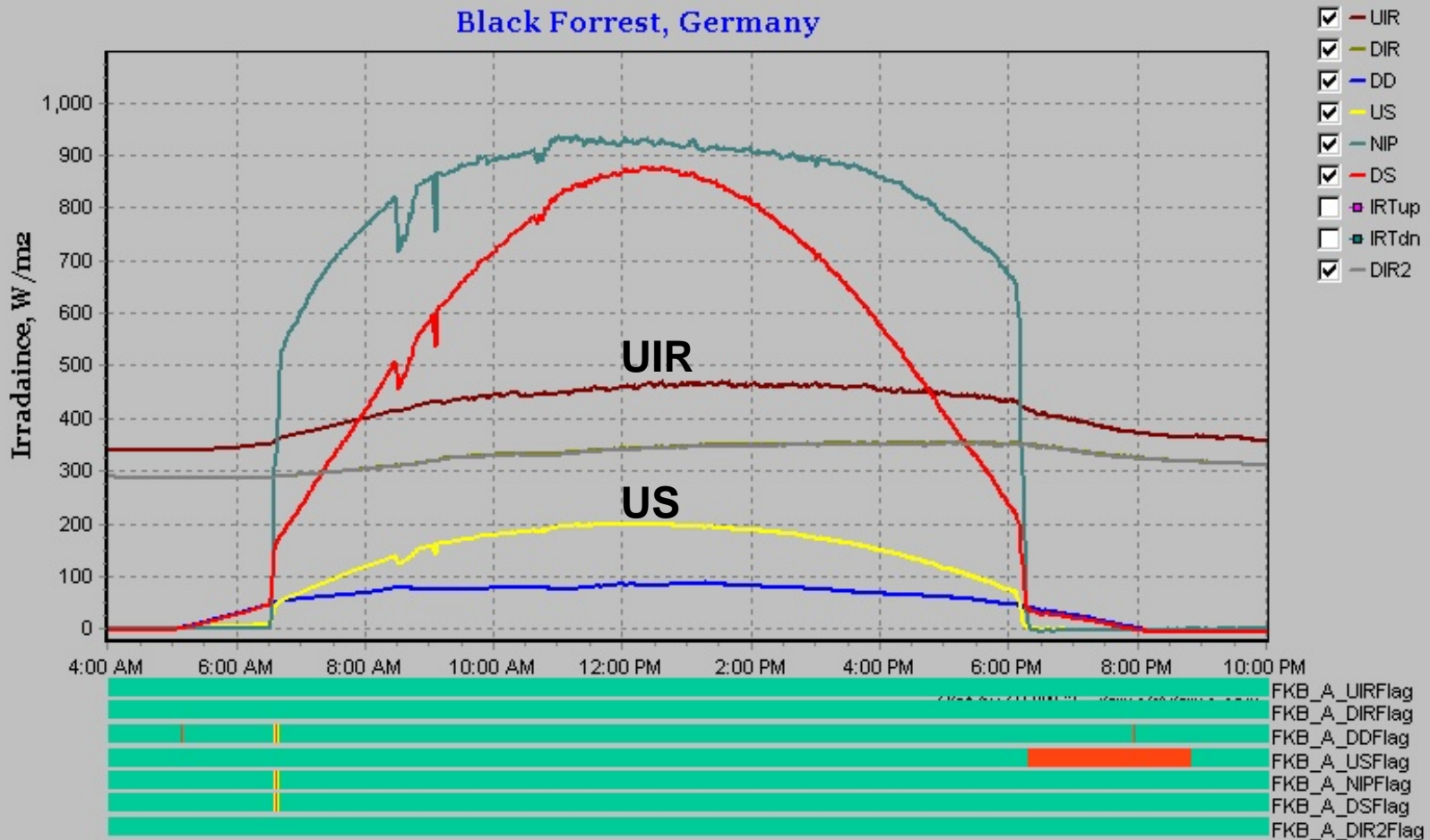
August 1, 2007



AMF Upwelling Irradiances

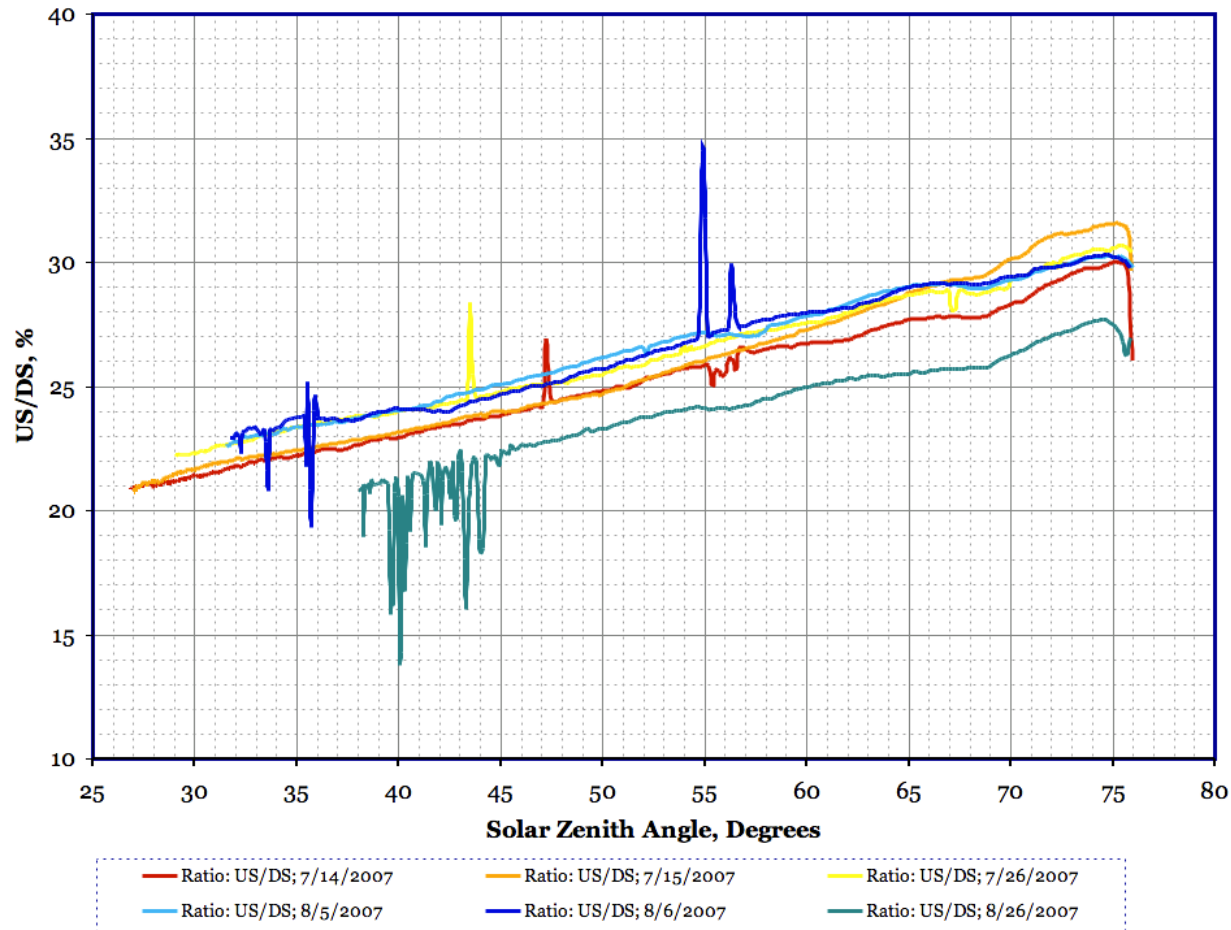
ARM Mobile Facility
Black Forrest, Germany

August 5, 2007



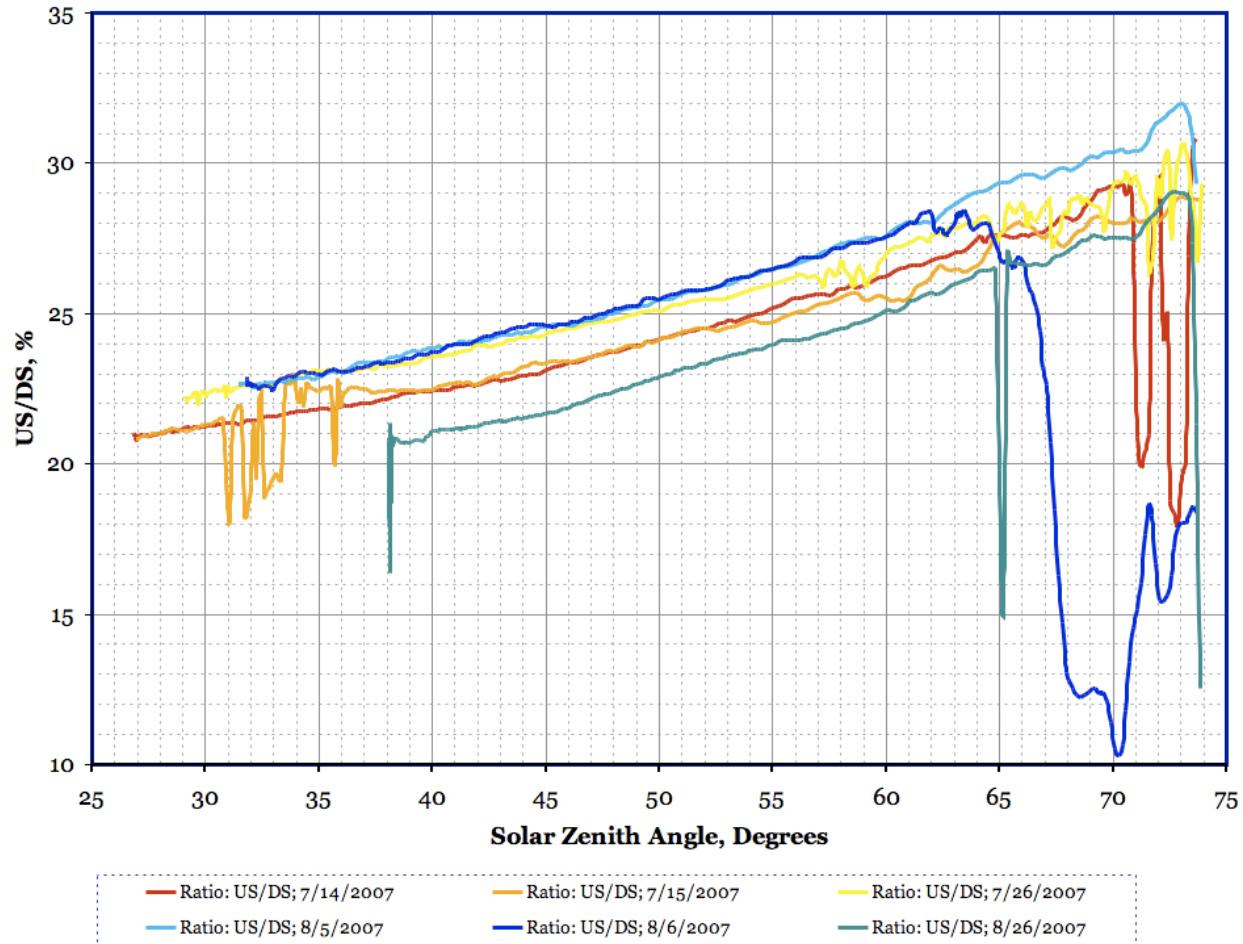
Surface Albedo (AM)

Upwelling Shortwave as a Percentage of Downwelling Shortwave
Morning Hours



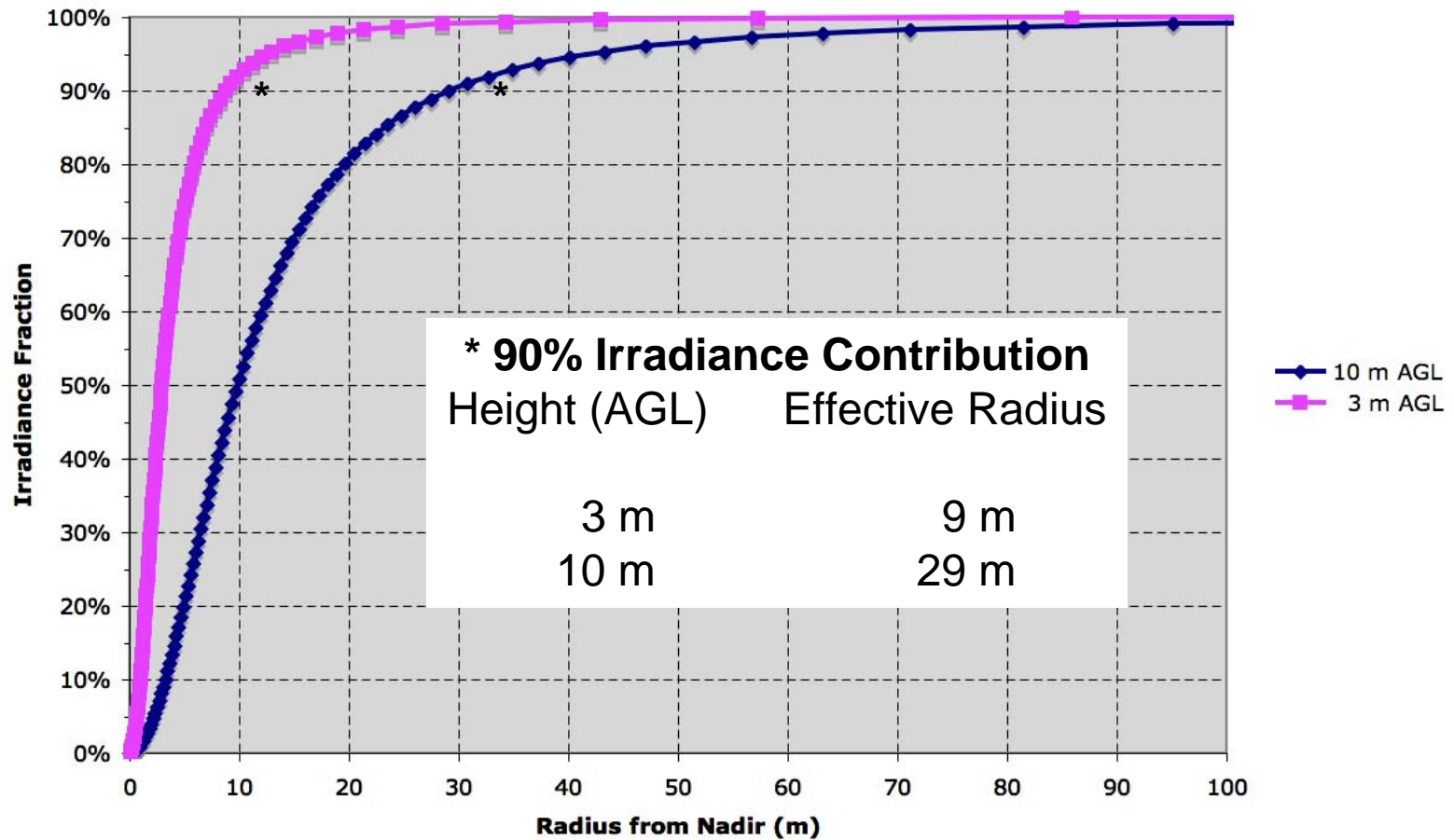
Surface Albedo (PM)

Upwelling Shortwave as a Percentage of Downwelling Shortwave
Afternoon Hours

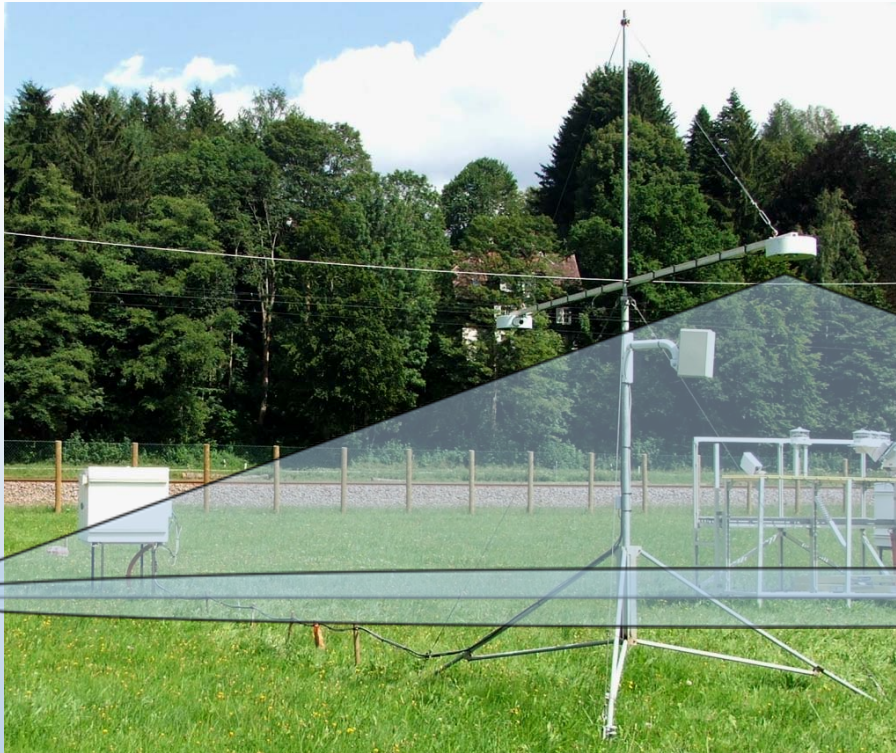


Radiometer View Factors

Cumulative Contributions to Upwelling Irradiance
(Isotropic radiation field)



Radiometer Sensitivities



Height = 3 m
Effective Radius (90%) = 9 m
Area = 254 m²

CoolCell = 1 m²
(less than 0.4% of view area)

Pyranometer +/- 10 Wm⁻² vs 0.4% of 200 Wm⁻² (0.8 Wm⁻²)
Pyrgeometer +/- 15 Wm⁻² vs 0.4% of 500 Wm⁻² (2.0 Wm⁻²)

Conclusions

- ***No measurable effects*** of white CoolCell on AMF upwelling irradiances
- Moving AMF GNDRAD radiometers to 10m tower provides ***better area representation*** of upwelling irradiances
- Logistically ***more challenging*** at 10m
- ***Intercomparison*** of radiometers before deploying ancillary station(s)

Thank You!