thermal analysis of the Lillis Business Complex atrium photovoltaic facade

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hypothesis:
The Photovoltaic array that populates the South façade of the Lillis Business Complex atrium has thermal effects on the interior space behind it.

18 degree (F) difference between control boxes

facade blocks 85% of irradiance

pv cell re-radiating heat to exterior layer of glass

process
Insulated 119 in³ boxes were placed on the inside of the glass facade, one behind a pv cell, the other in full view of the sun. Dataloggers collected temperature data over 3.5 hours (Images 1, 4)

Irradiance data was collected with a Ly-Cal Light Meter at fifteen minute intervals inside and outside the building at 5 different points on one pane of glass, both behind pv cells and beside them (See images 1, 2)

Surface temperature data was collected with a Raytek M2Therm at fifteen minute intervals inside and outside the building at 5 different points on one pane of glass, both behind pv cells and beside them (See image 1, 3)

average of points A - E inside atrium: difference of irradiance values behind pv cells and exposed to direct sunlight

23FEB2008

10:30 12:00 14:00

INTENSITY COMPARISON OF POINTS A-E AVERAGE IRRADIATION VALUES

24FEB2008

10:30 12:00 14:00

INTENSITY COMPARISON OF POINTS A-E AVERAGE IRRADIATION VALUES