

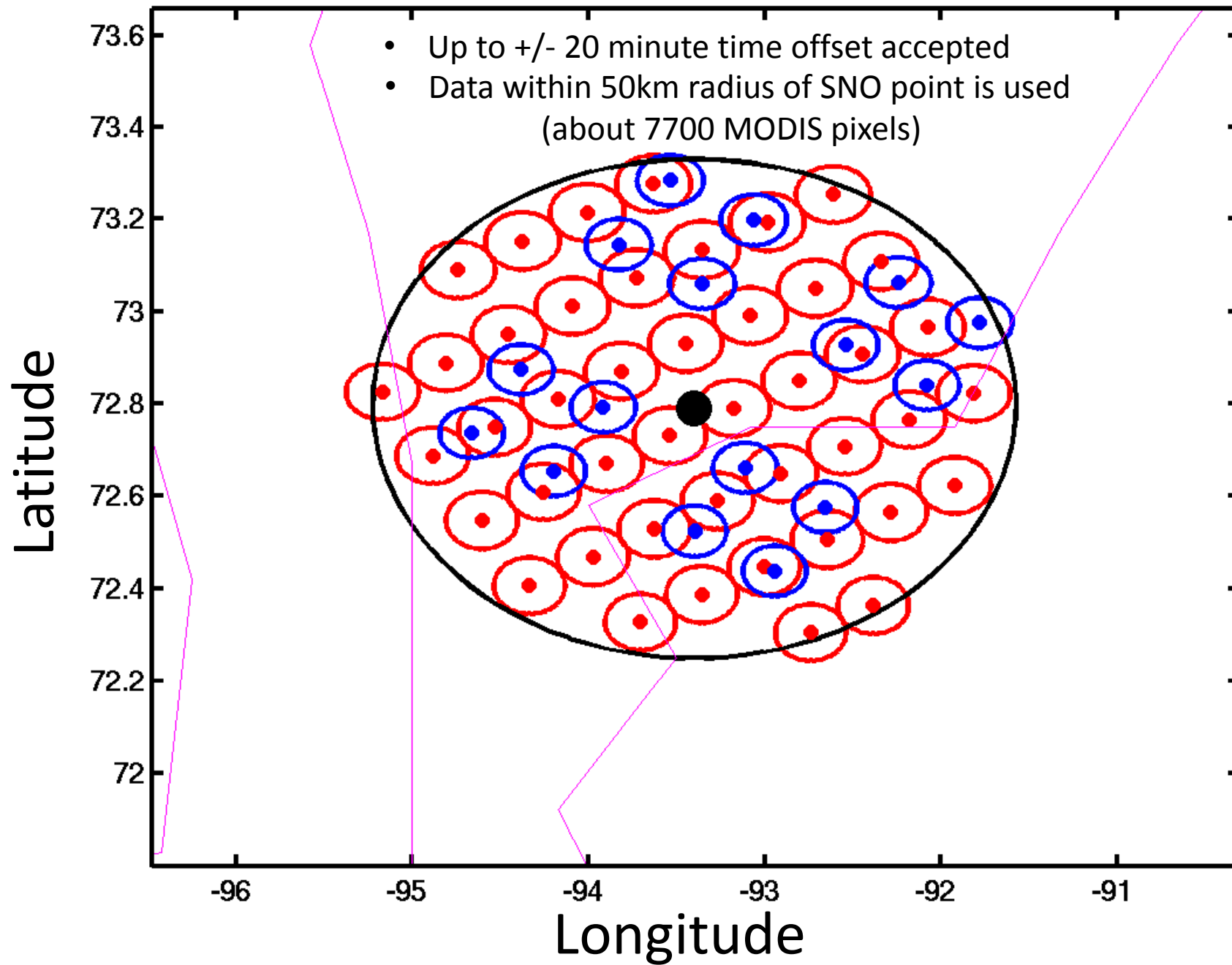
IASI – MODIS TEB Comparisons

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University of Wisconsin
MODIS Calibration Mtg
May 17, 2011

Data Set Characteristics

- SNOs for Year 2009 (~3000 matchups)
- MODIS L1A data processed to L1B using MODISL1DB V1.5 (equivalent to Collection 5)
- No spectral shifts applied to MODIS RSR
- No destriping of MODIS L1B data
- Filtering applied to remove cases with highly structured scenes

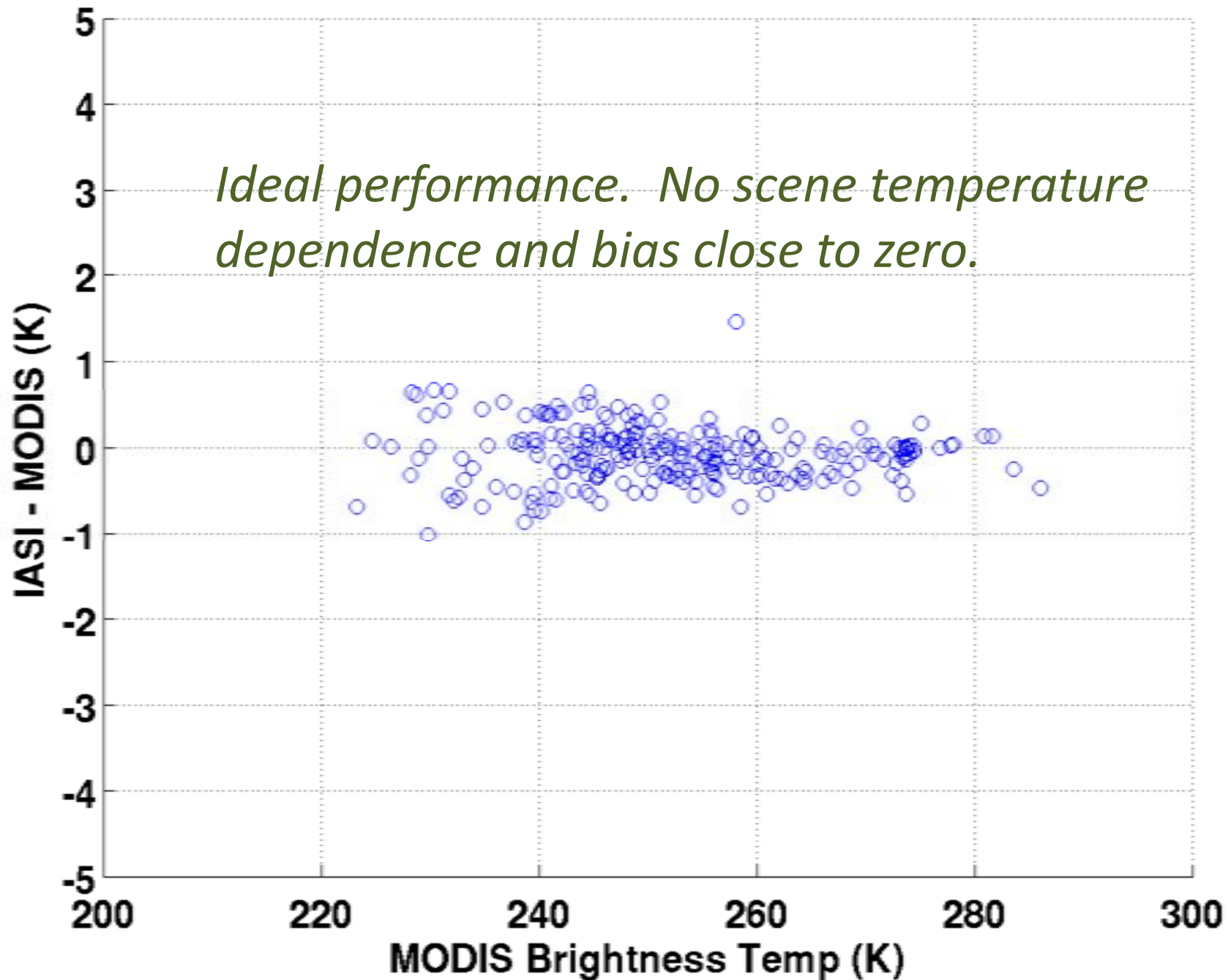
SNO Representation



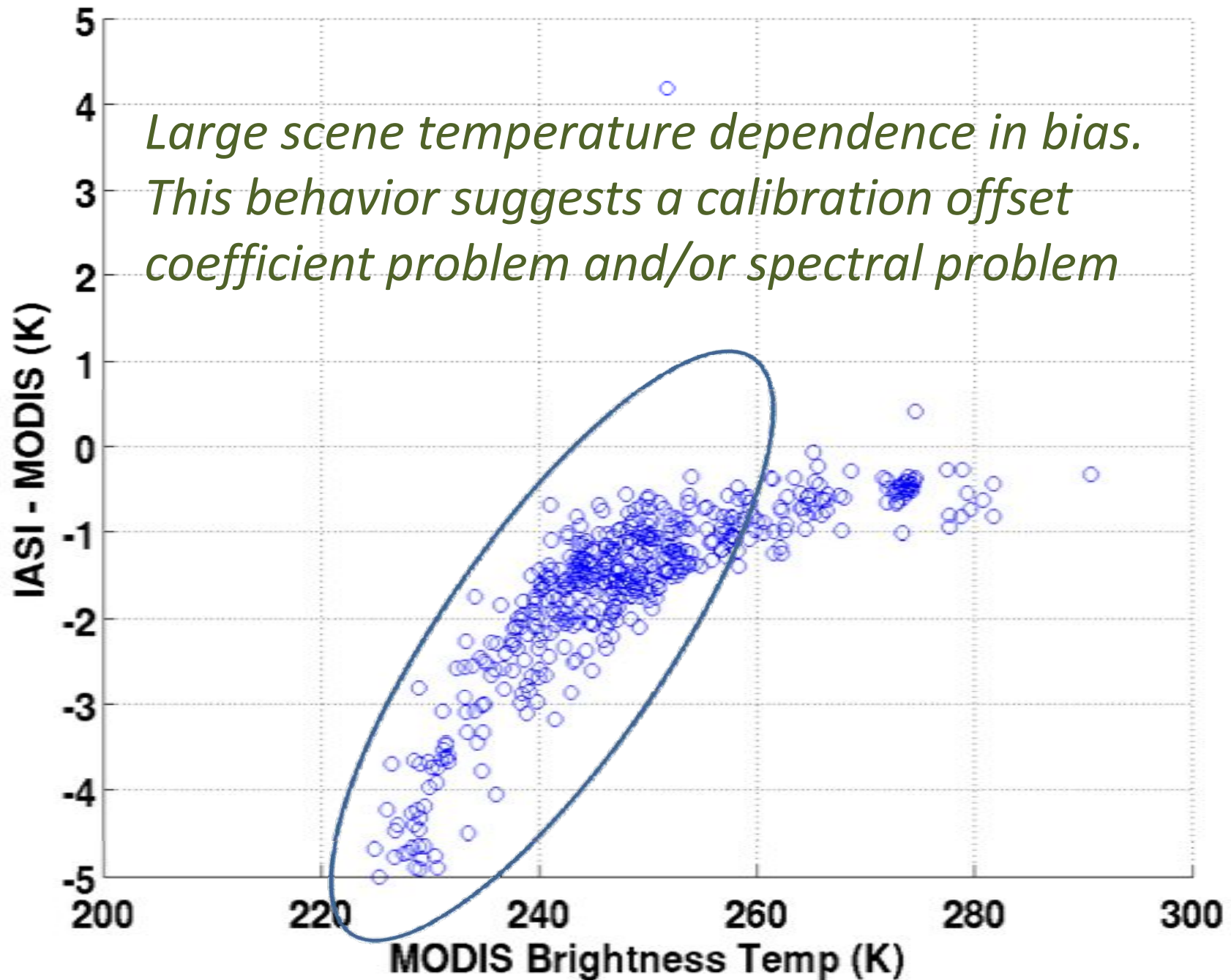
IASI – MODIS TEB Comparisons: MWIR (20-25) and PV LWIR (27-30) Bands

- Aqua MODIS bands by and large performing well (not much scene temperature dependence) but some bands may benefit from spectral adjustment or small adjustment of offset coefficient.
- Terra MWIR and LWIR PV bands showing very significant biases for cold scene temperatures. Offset coefficient problem seems likely.

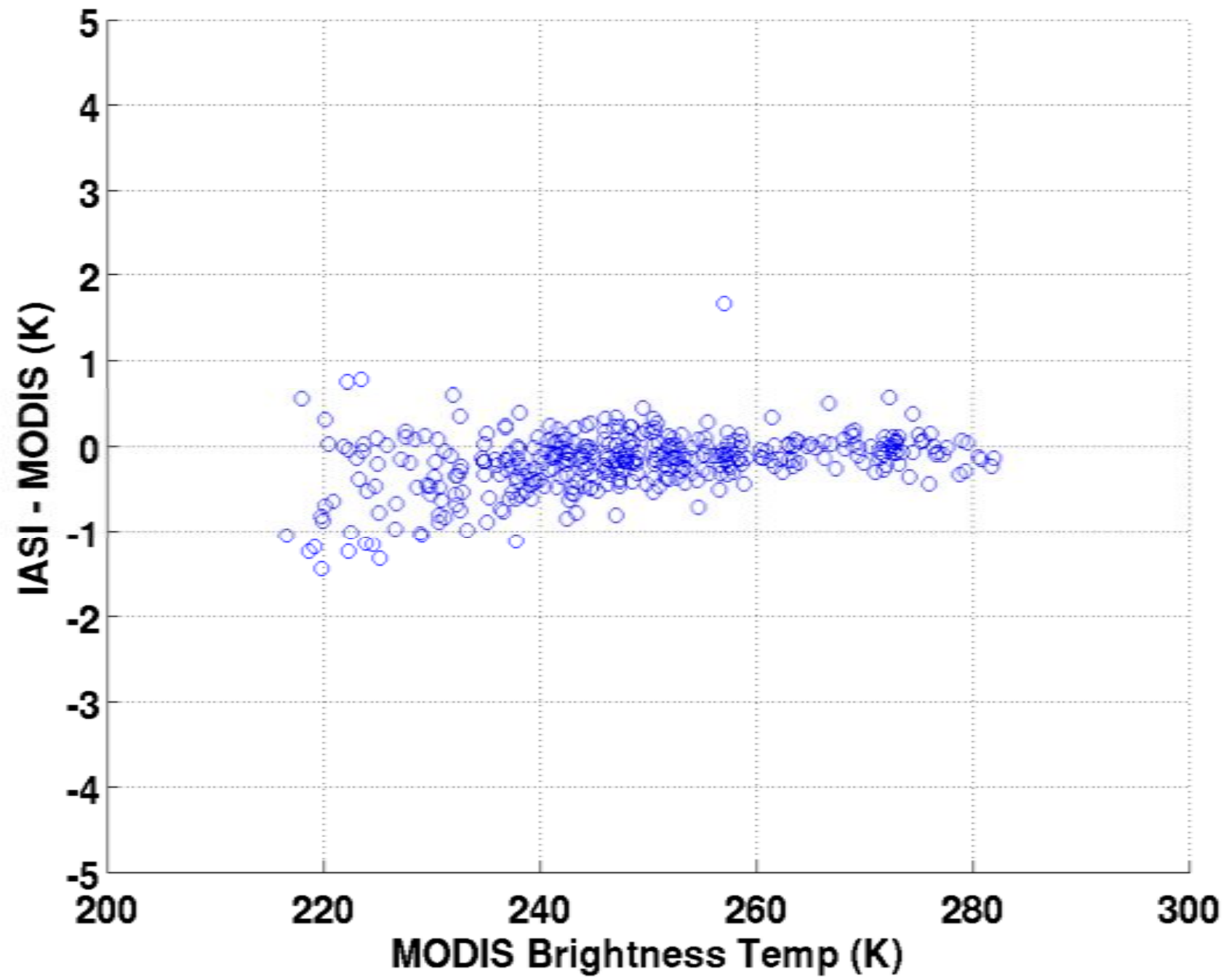
2009 SNOs: IASI - Aqua MODIS Band 20 Det 5 MS 1



2009 SNOs: IASI - Terra MODIS Band 20 Det 5 MS 1

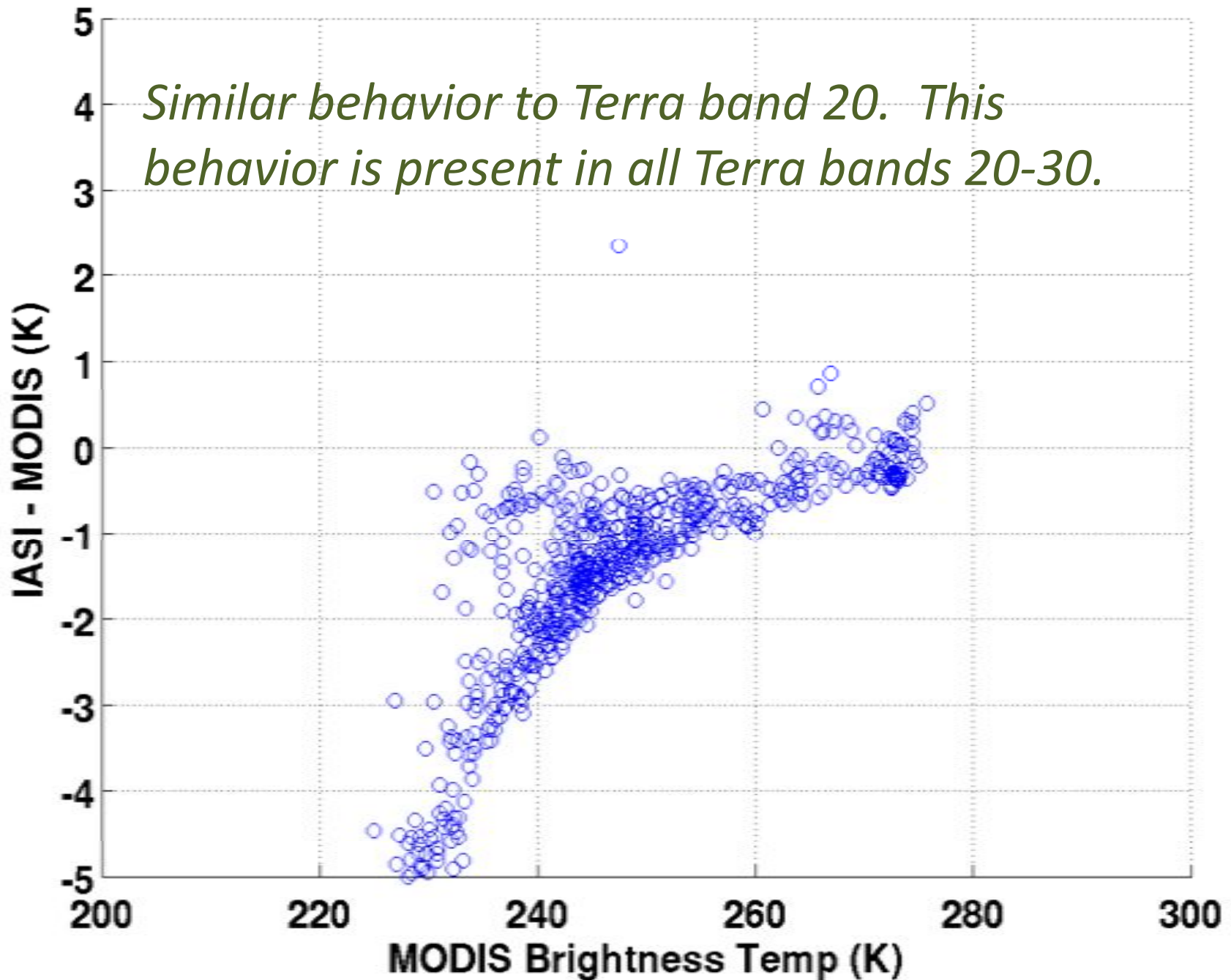


2009 SNOs: IASI - Aqua MODIS Band 22 Det 5 MS 1

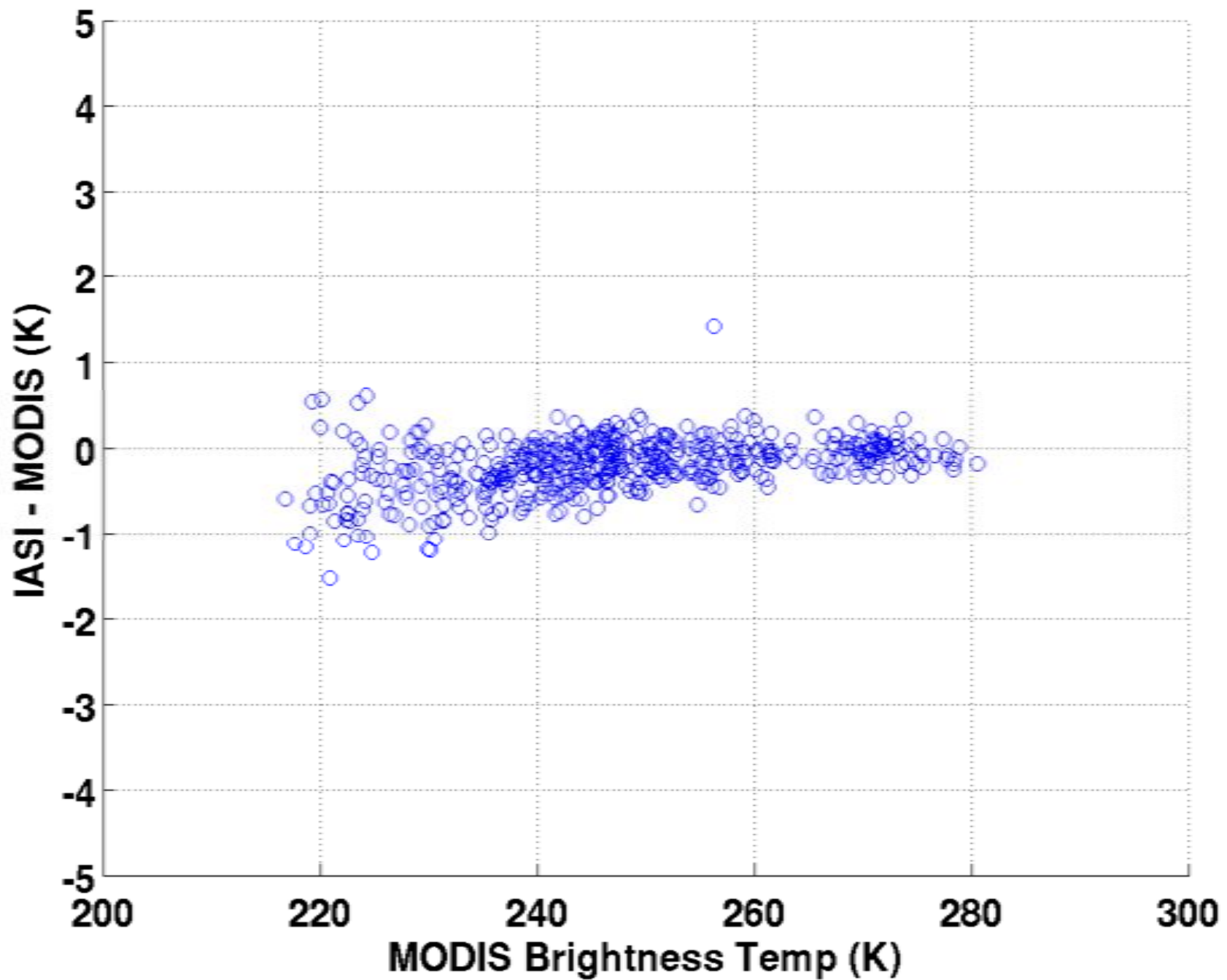


2009 SNOs: IASI - Terra MODIS Band 22 Det 5 MS 1

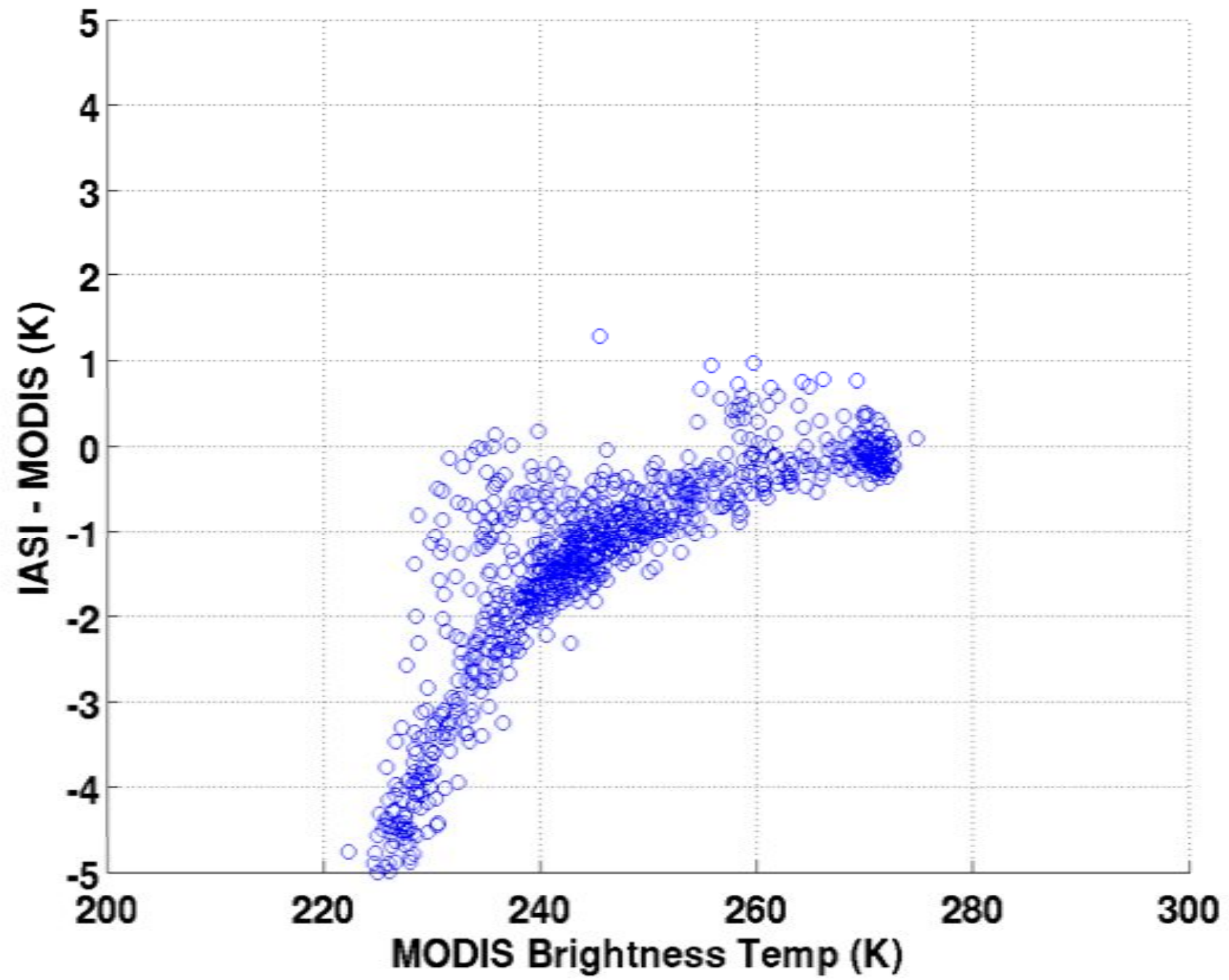
Similar behavior to Terra band 20. This behavior is present in all Terra bands 20-30.



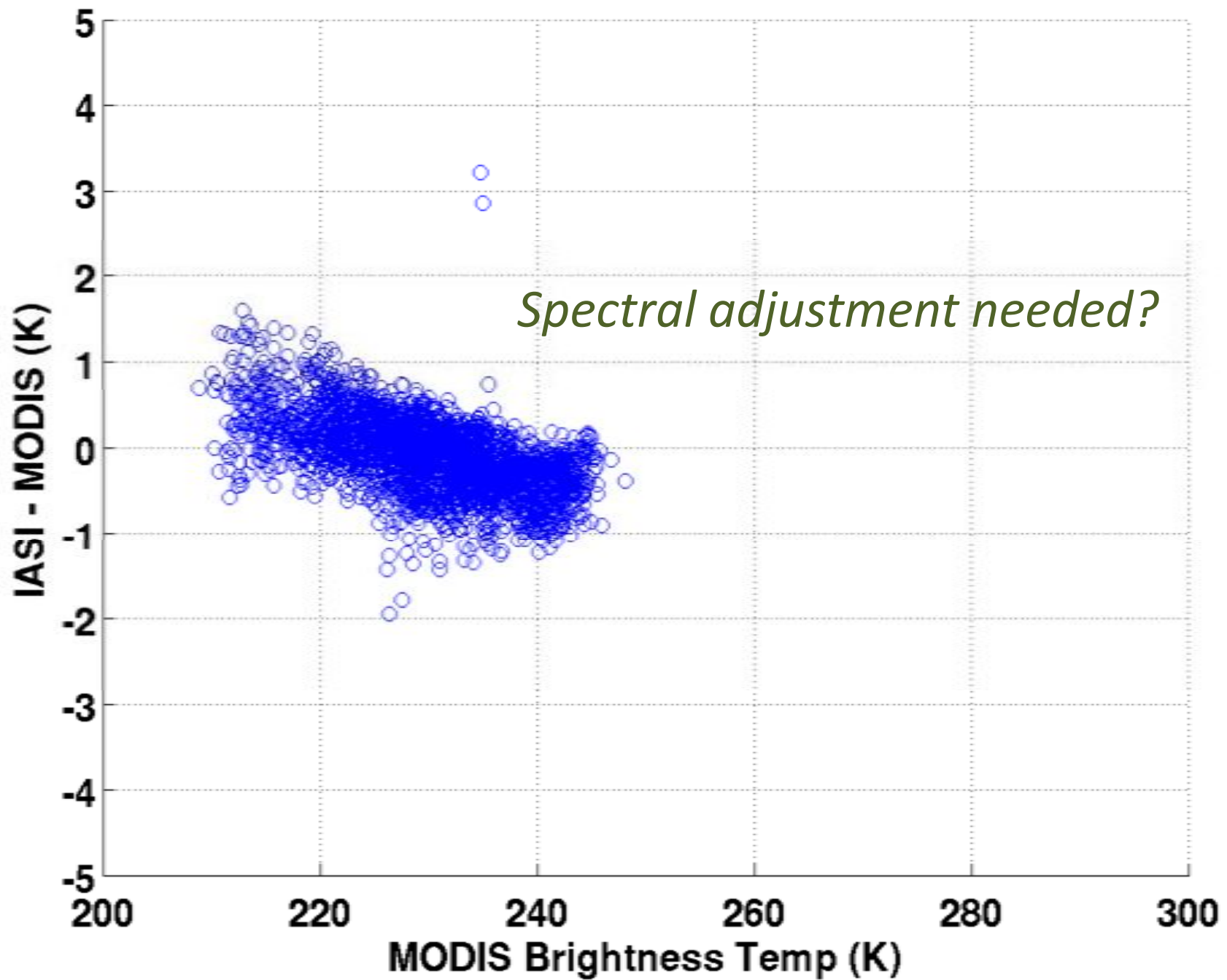
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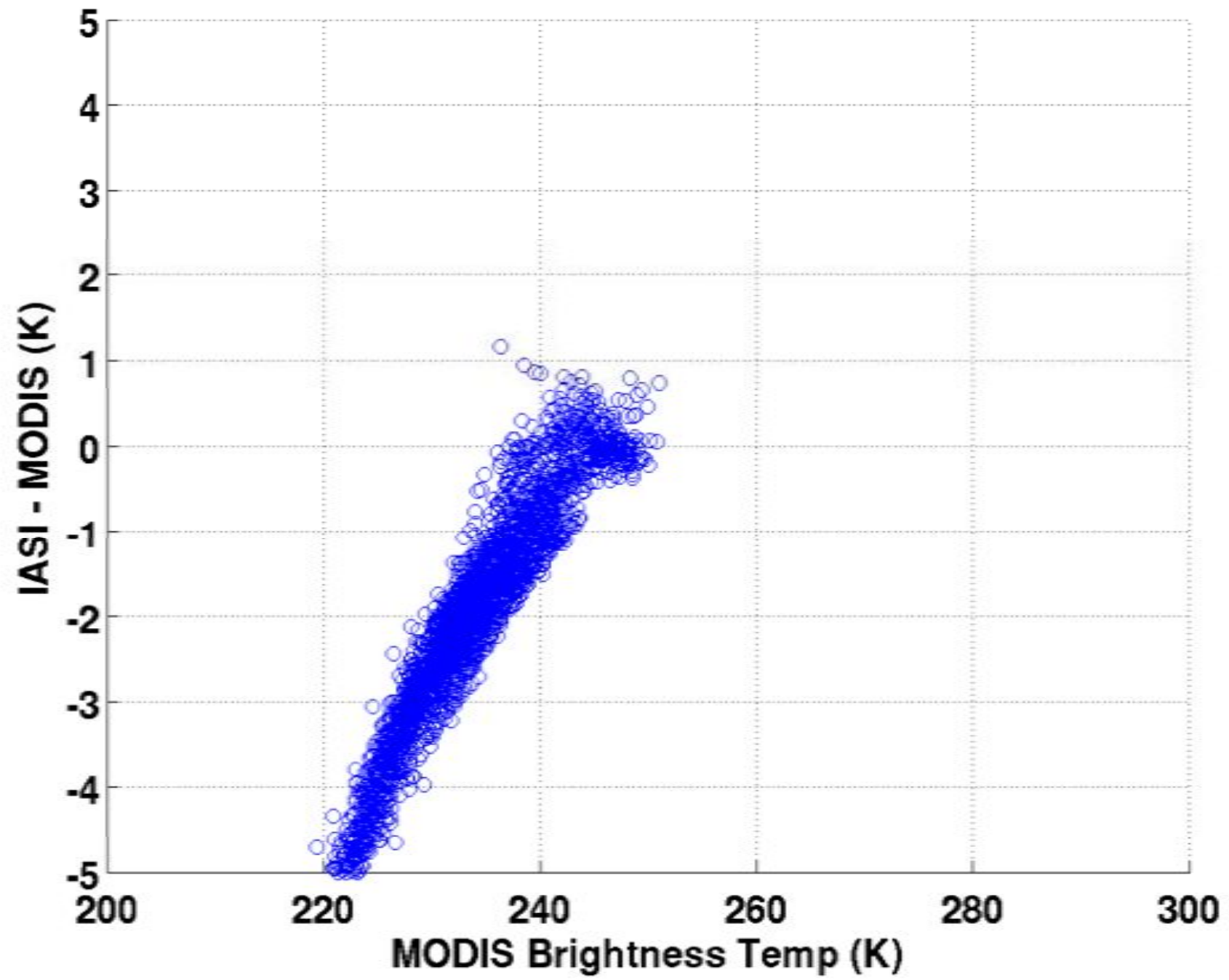
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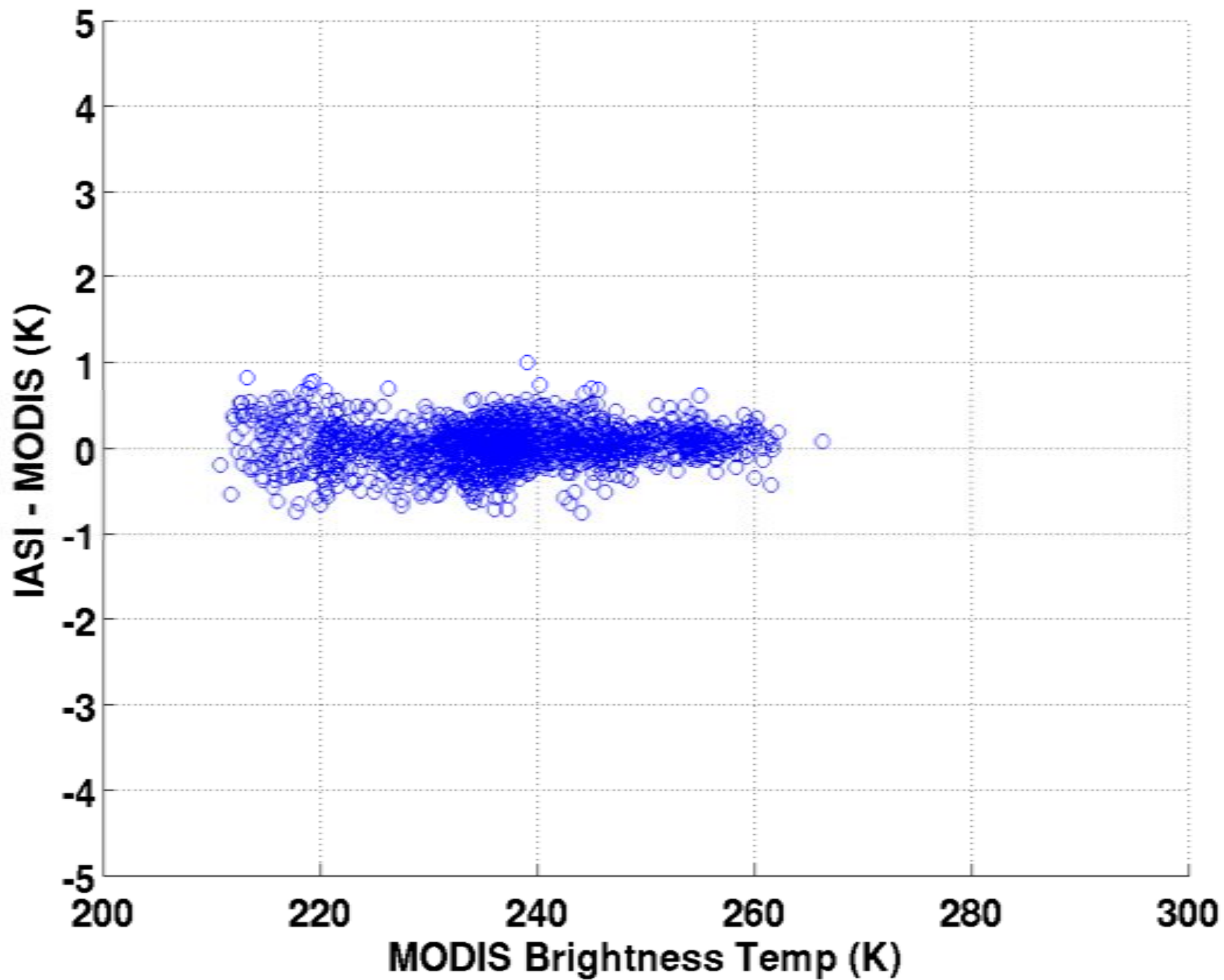
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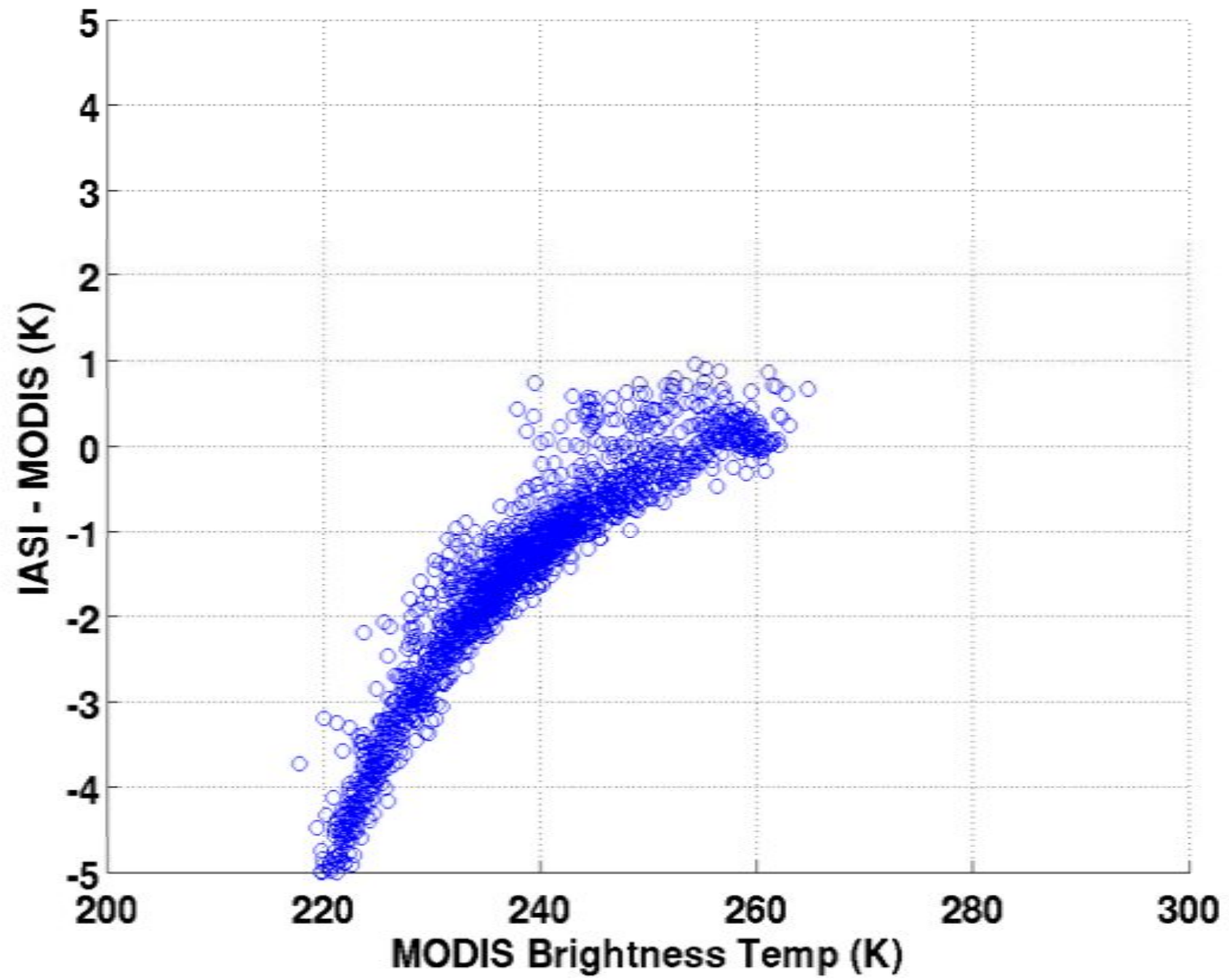
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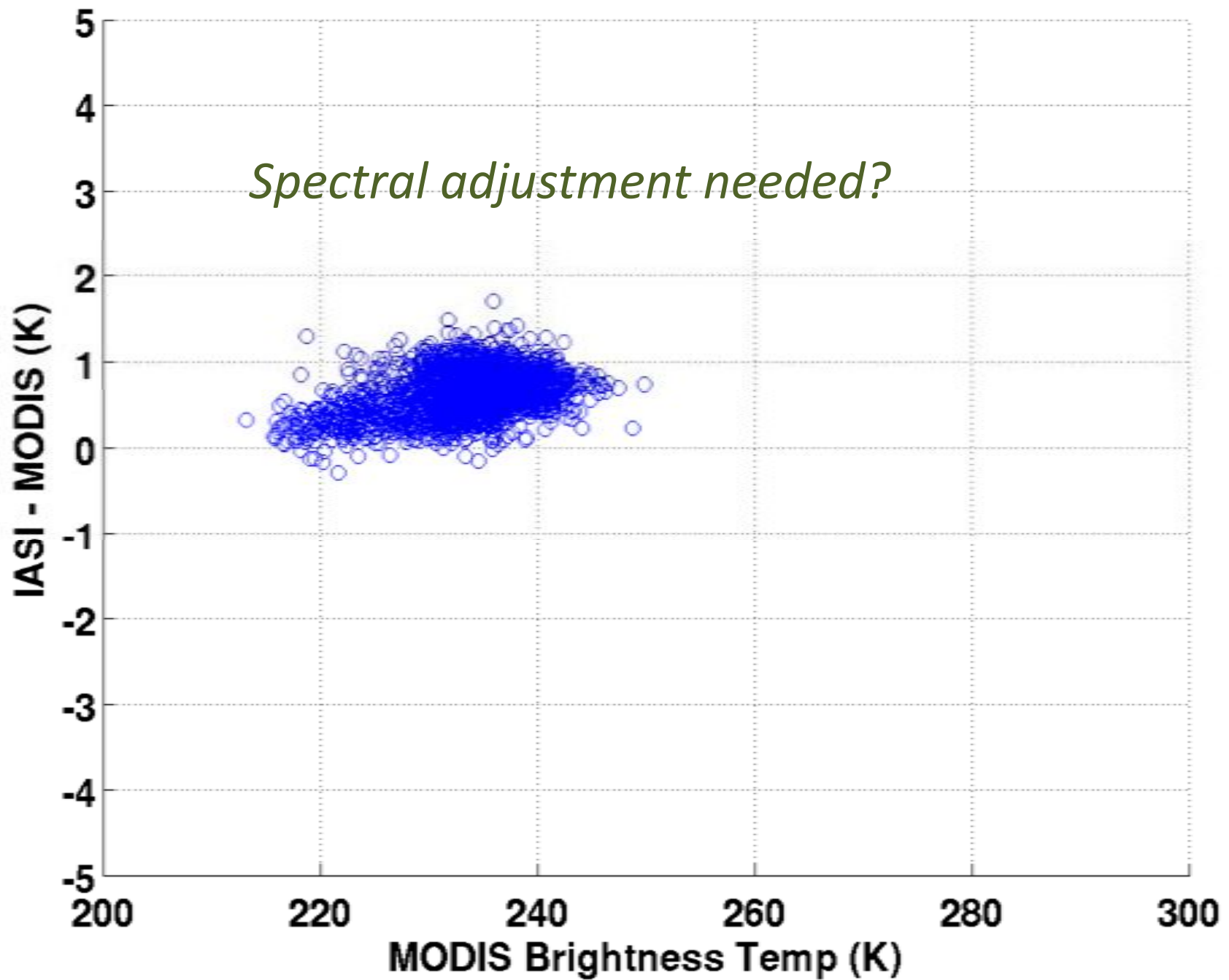
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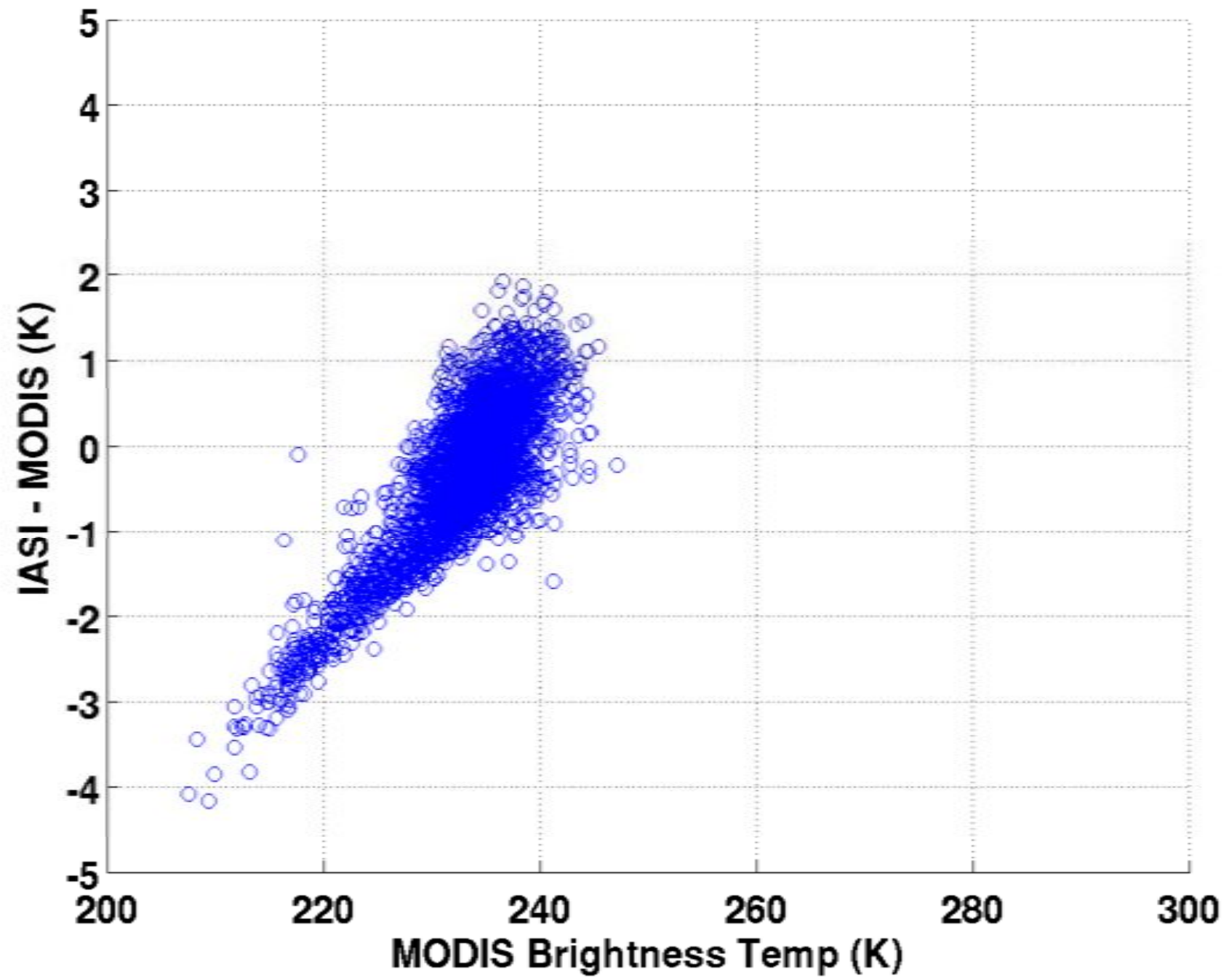
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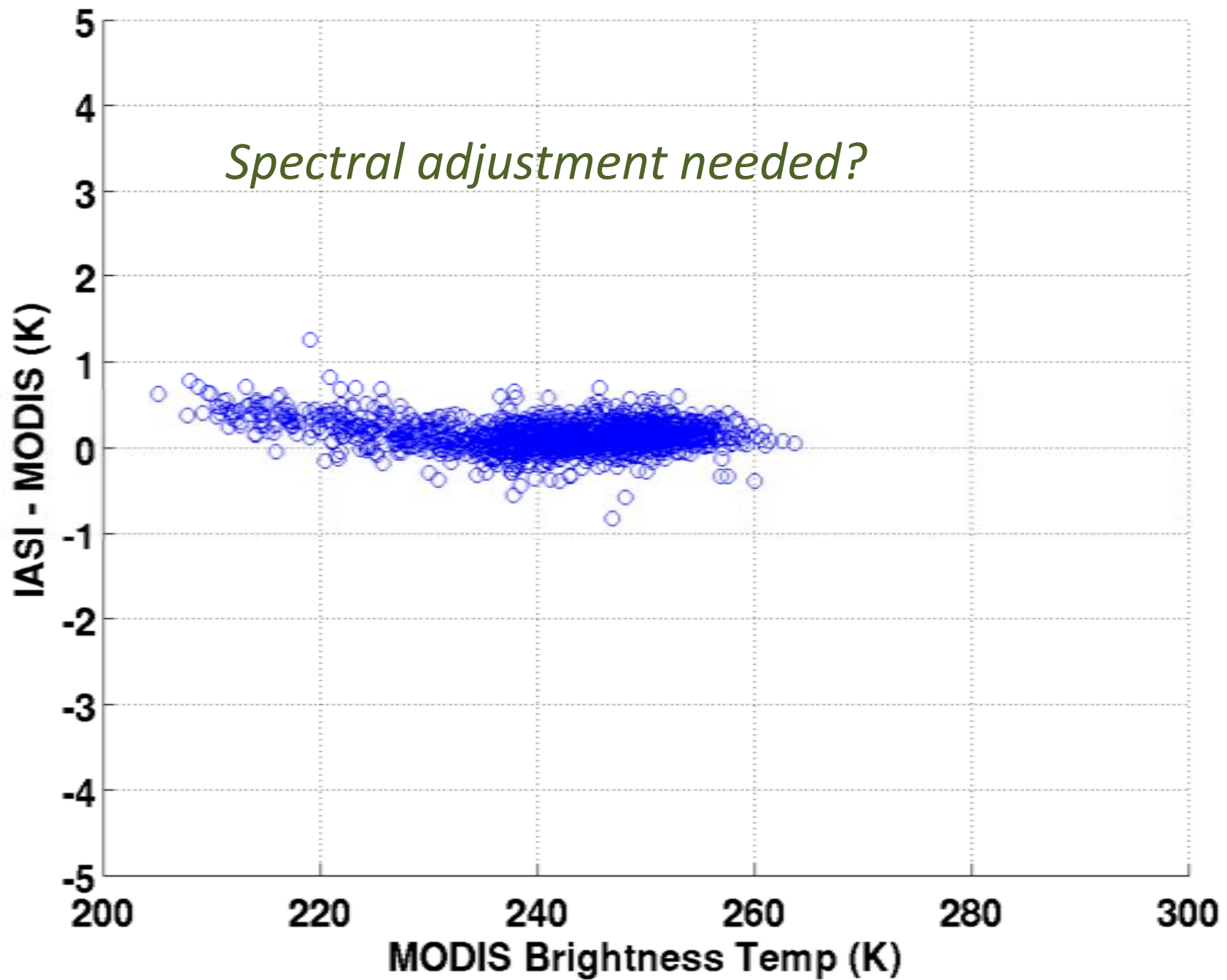
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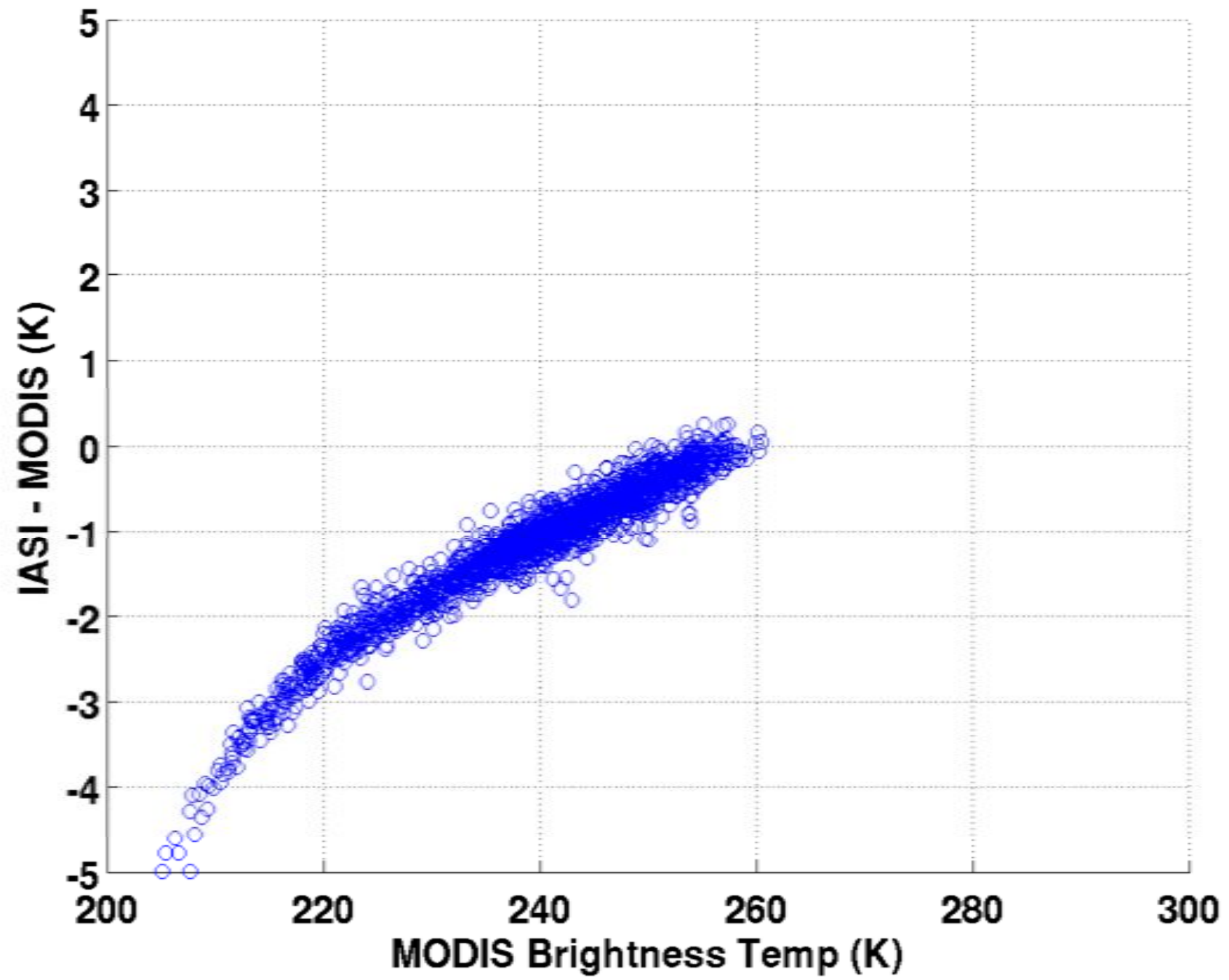
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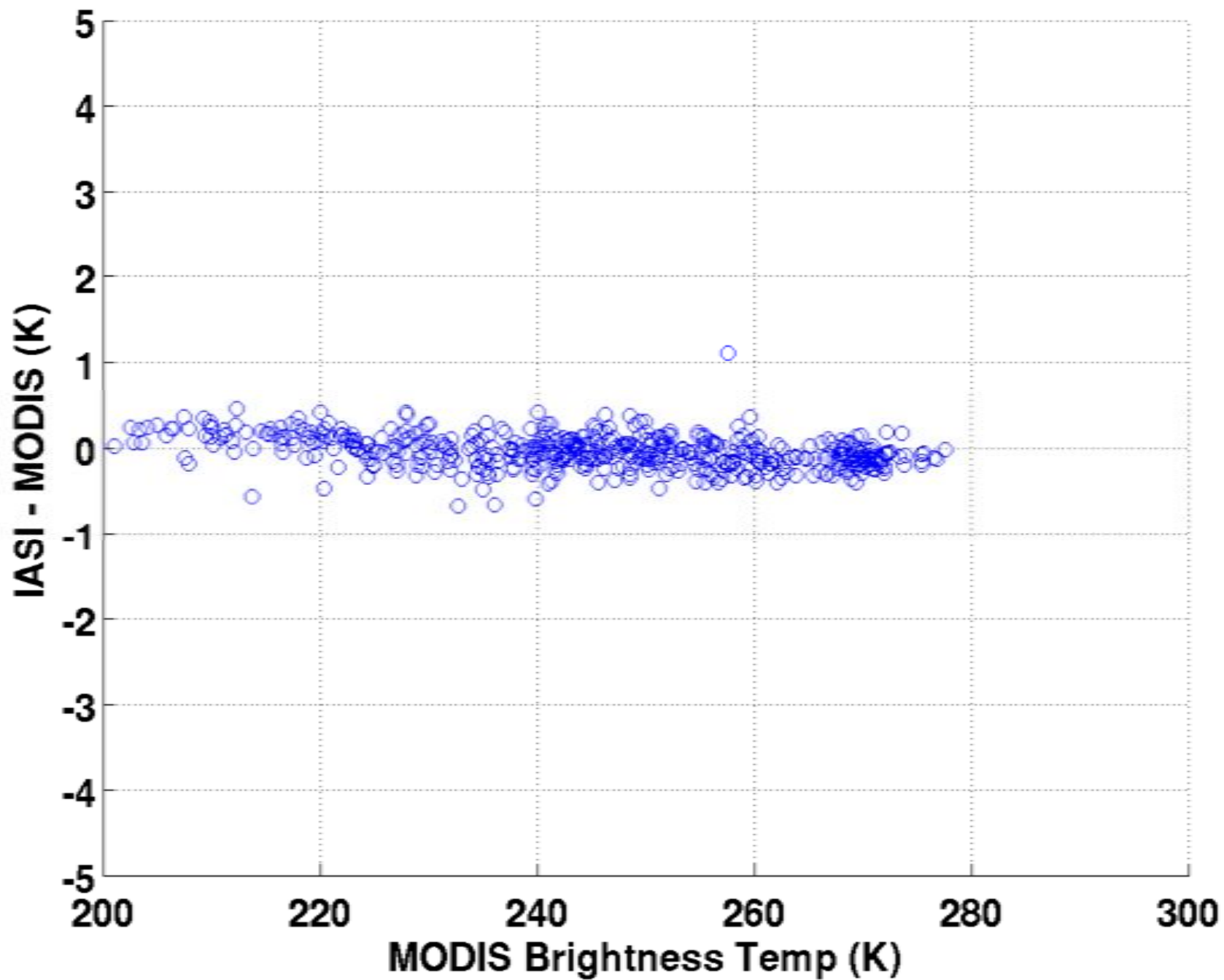
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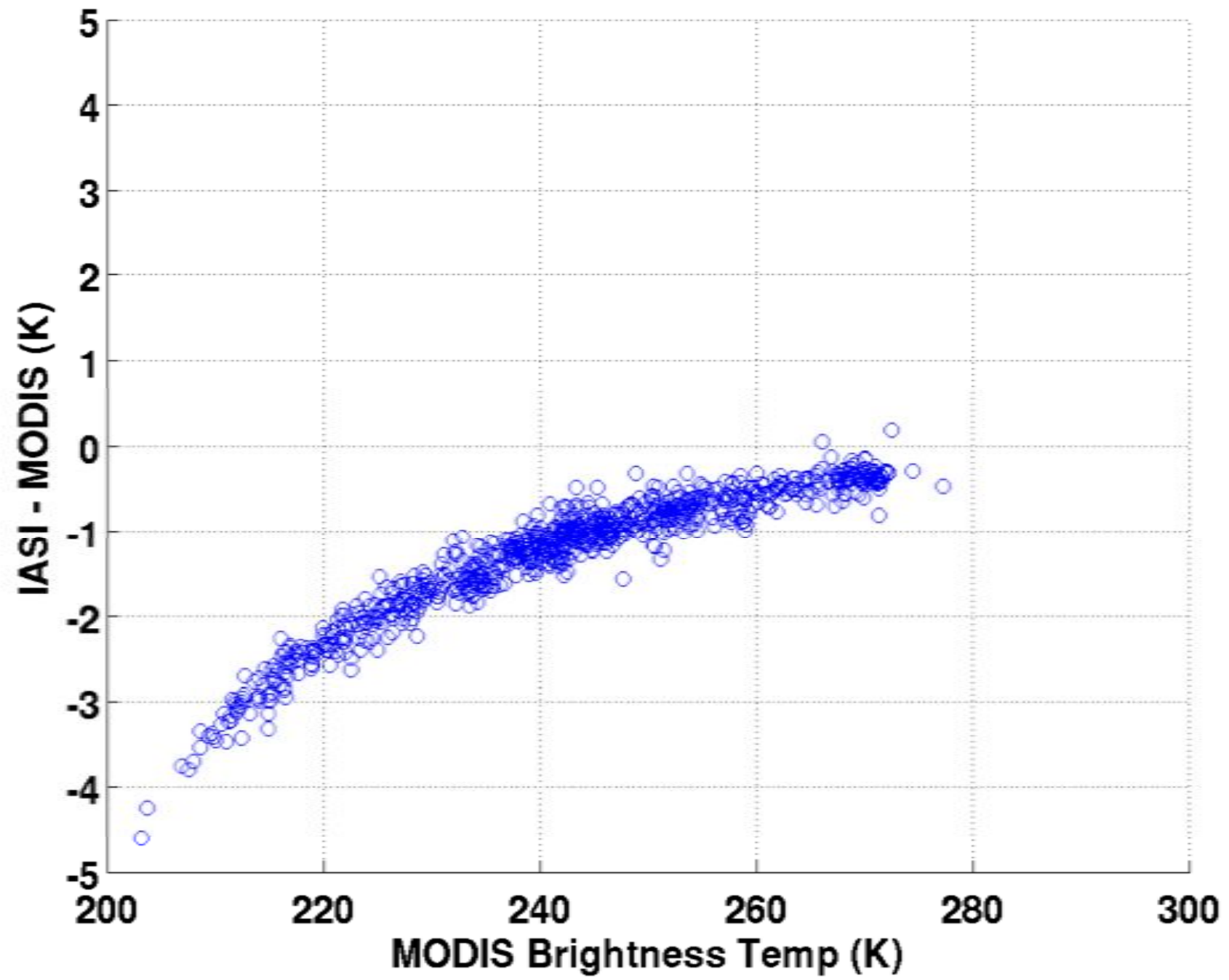
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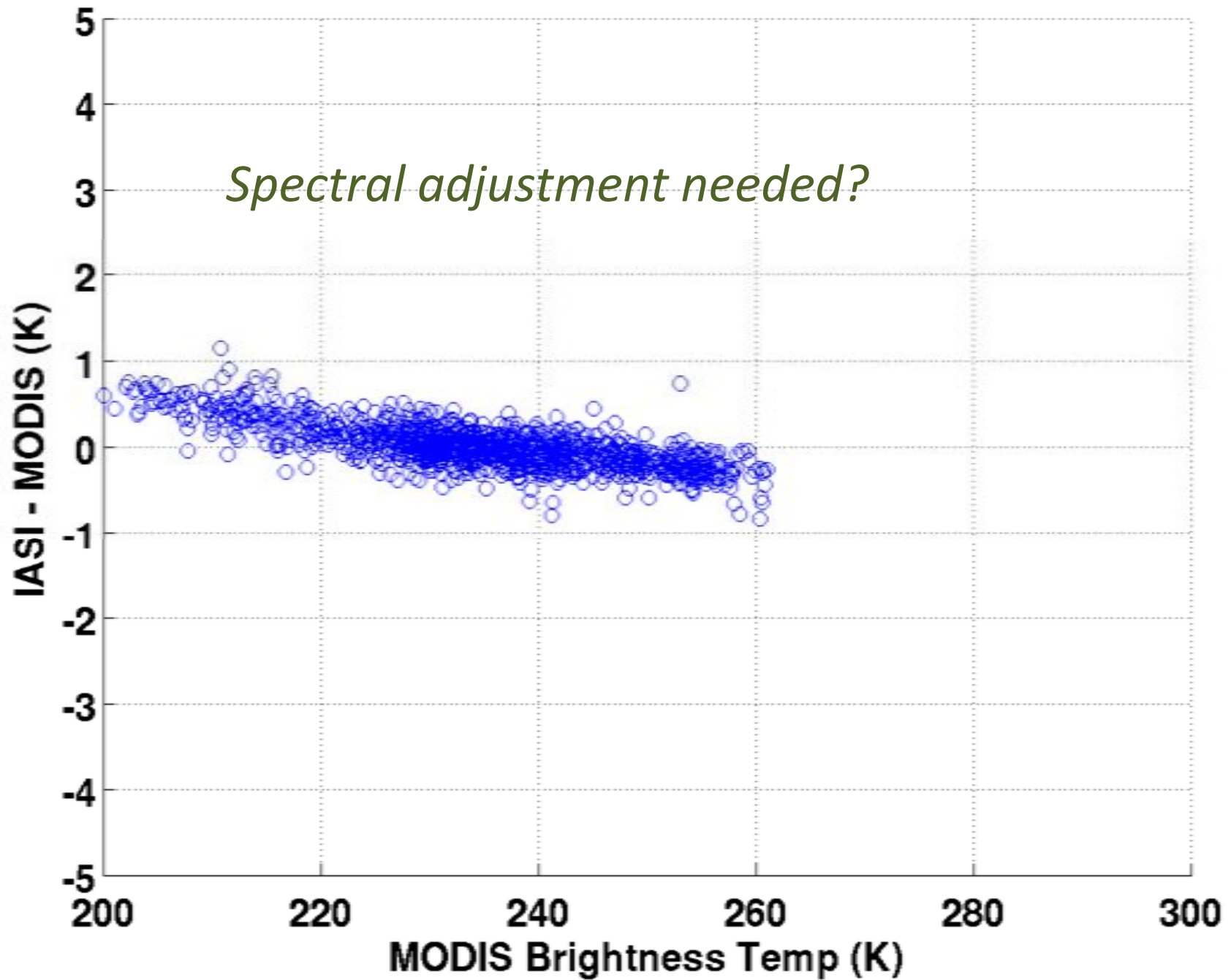
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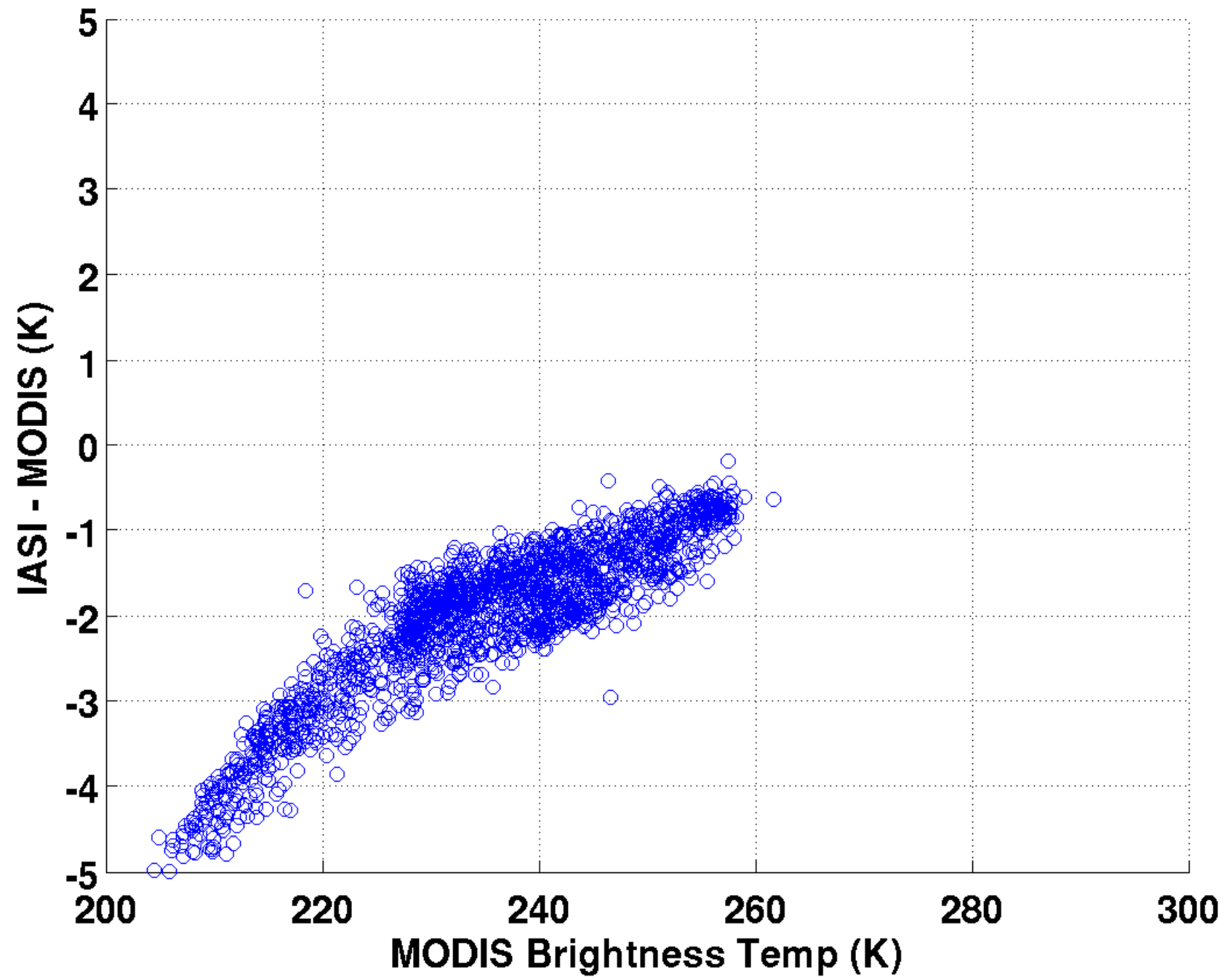
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2009 SNOs: IASI - Aqua MODIS Band 30 Det 5 MS 1



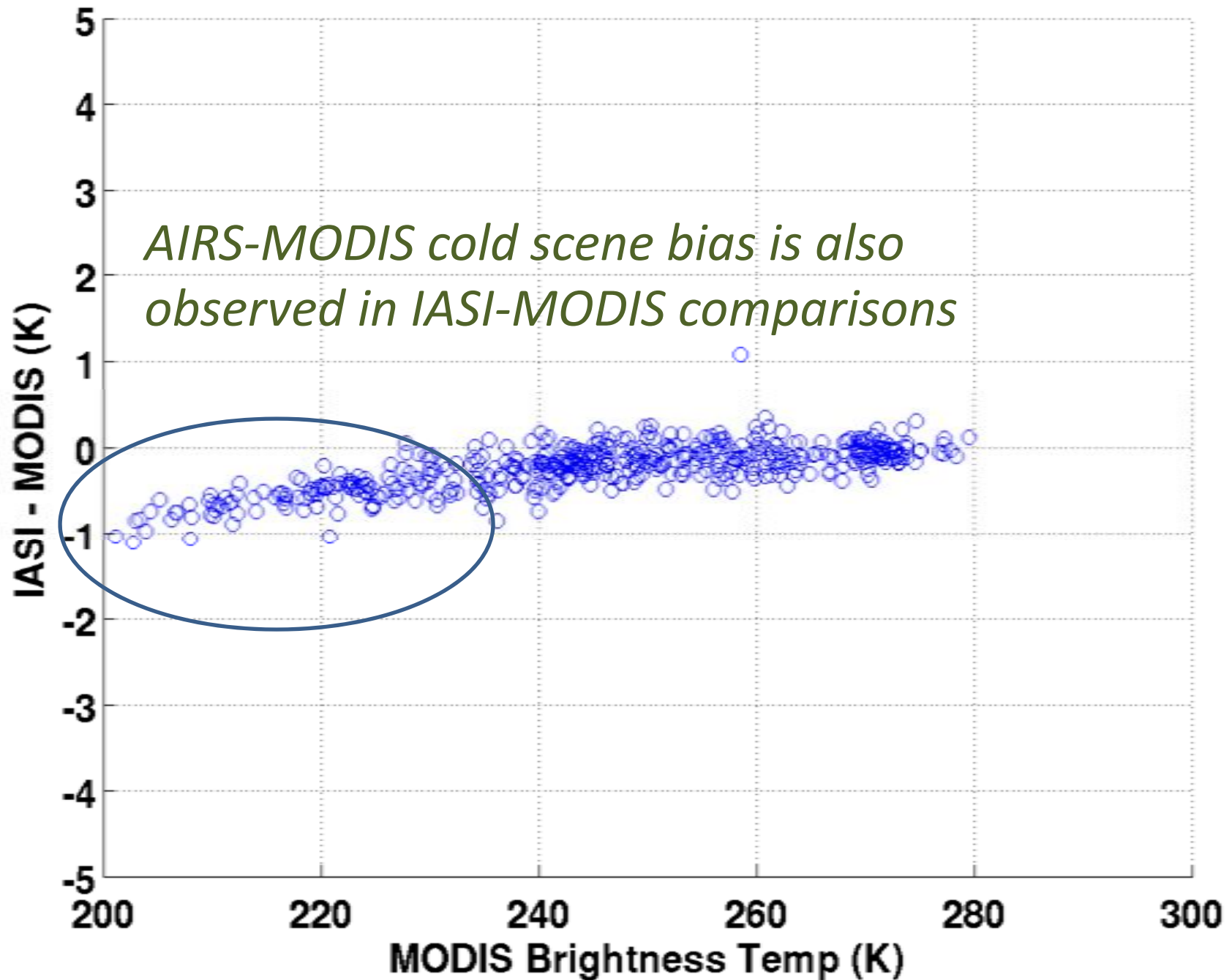
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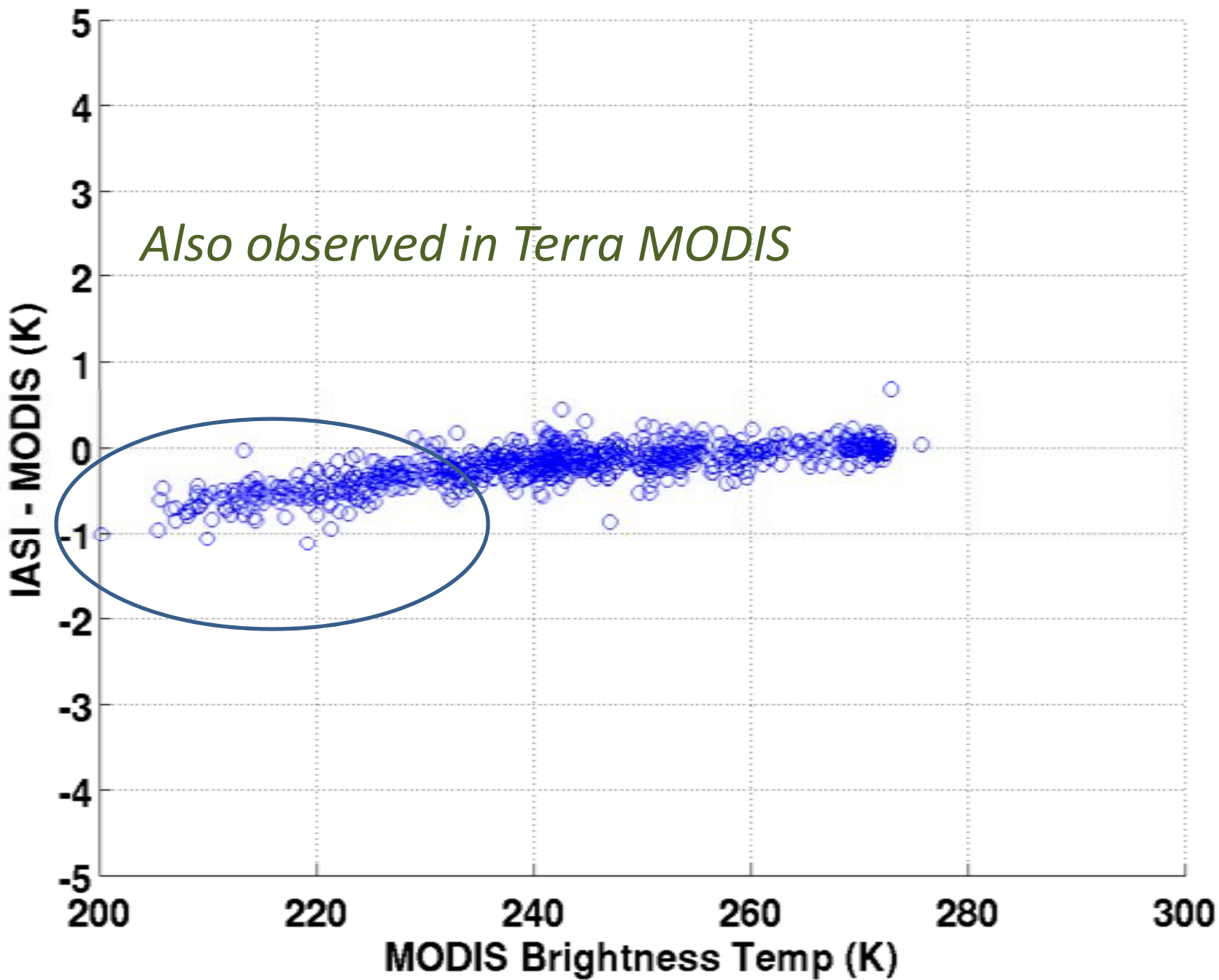
IASI – MODIS TEB Comparisons: PC LWIR Bands (31-36)

- Aqua and Terra MODIS bands performing similarly.
- B31 and B32 are similarly biased at cold end for both sensors
- Slope in B33-36 plots similar for both sensors suggesting possible similar spectral adjustment for both sensors. Also suggests that Terra optical crosstalk correction was highly effective.

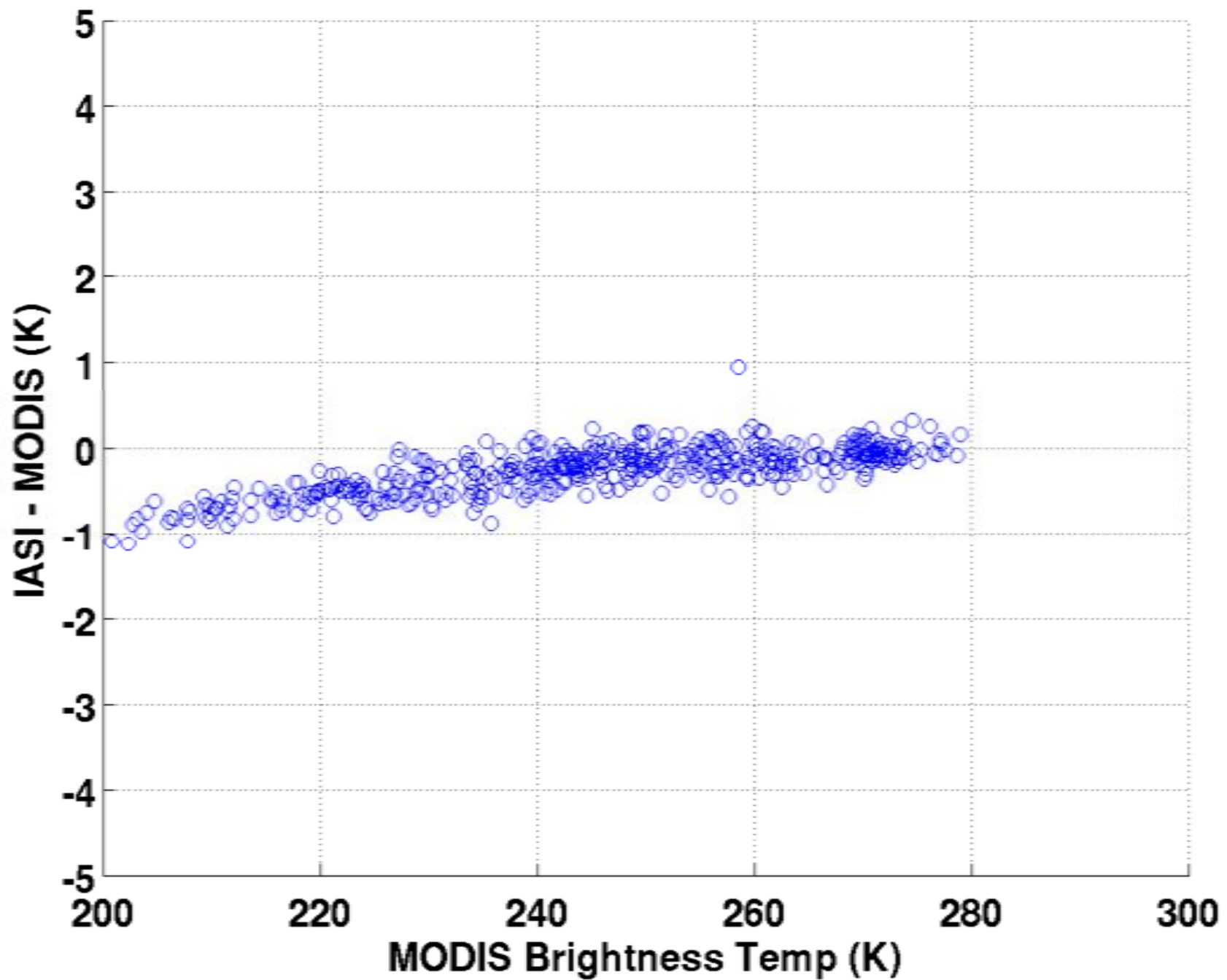
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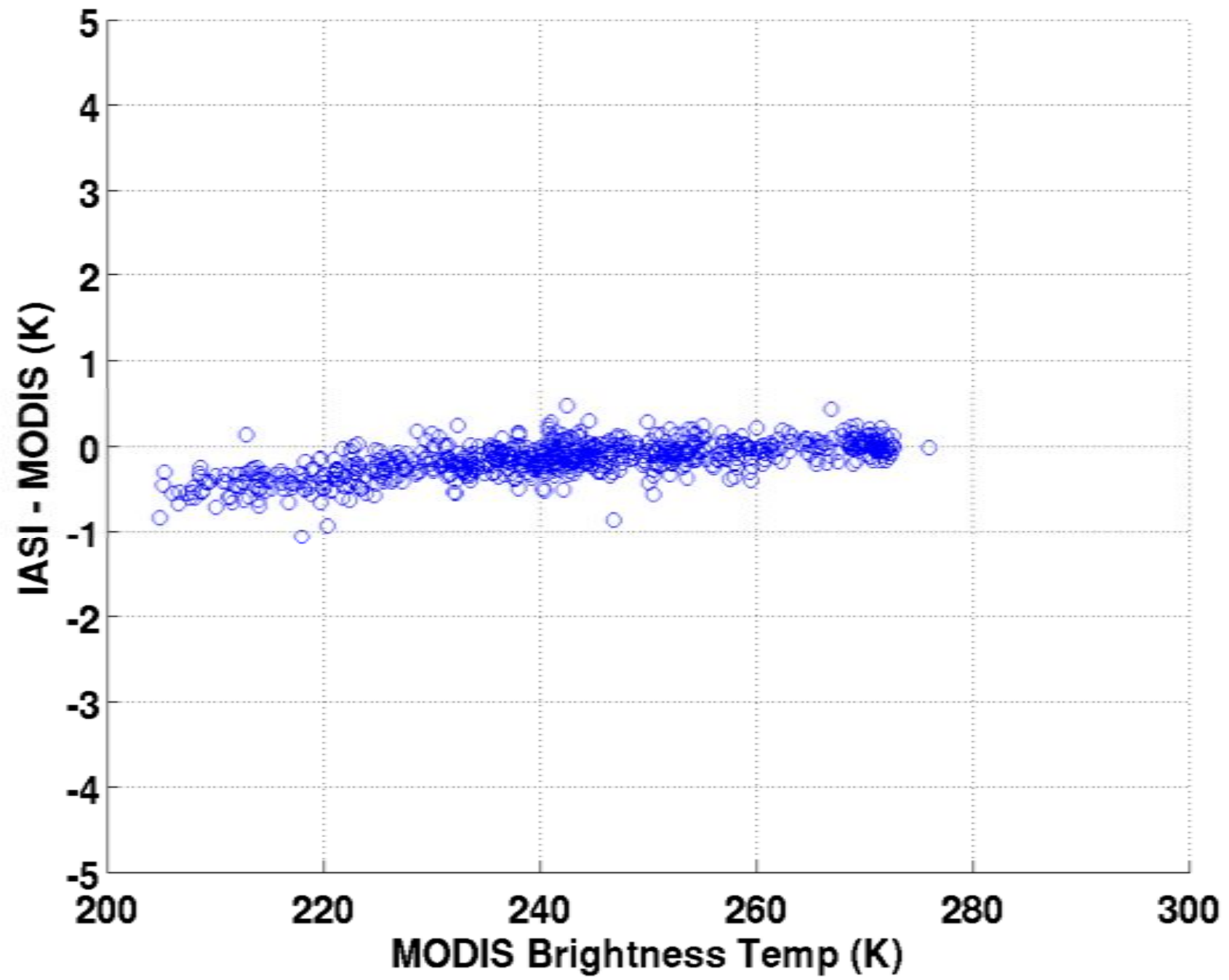
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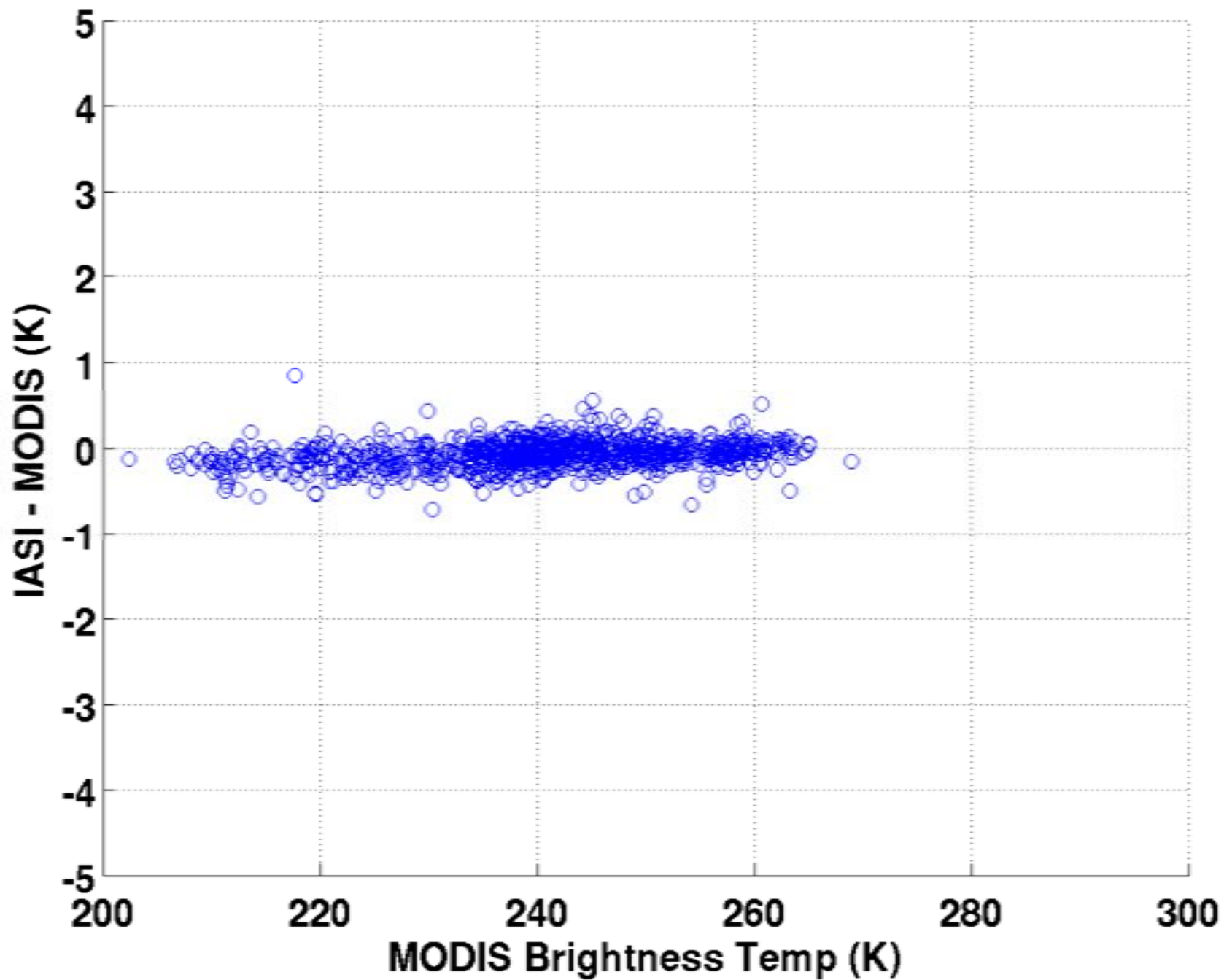
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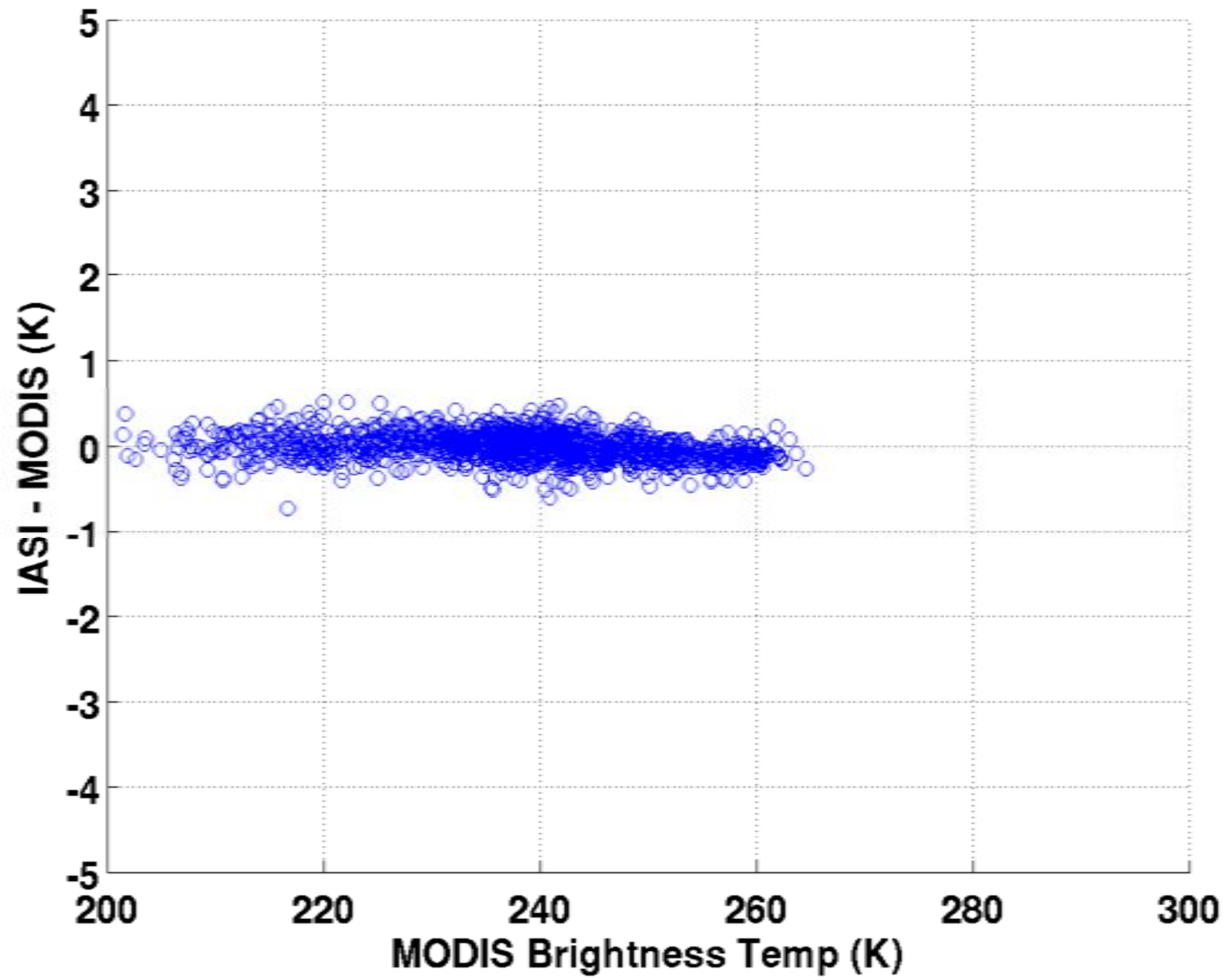
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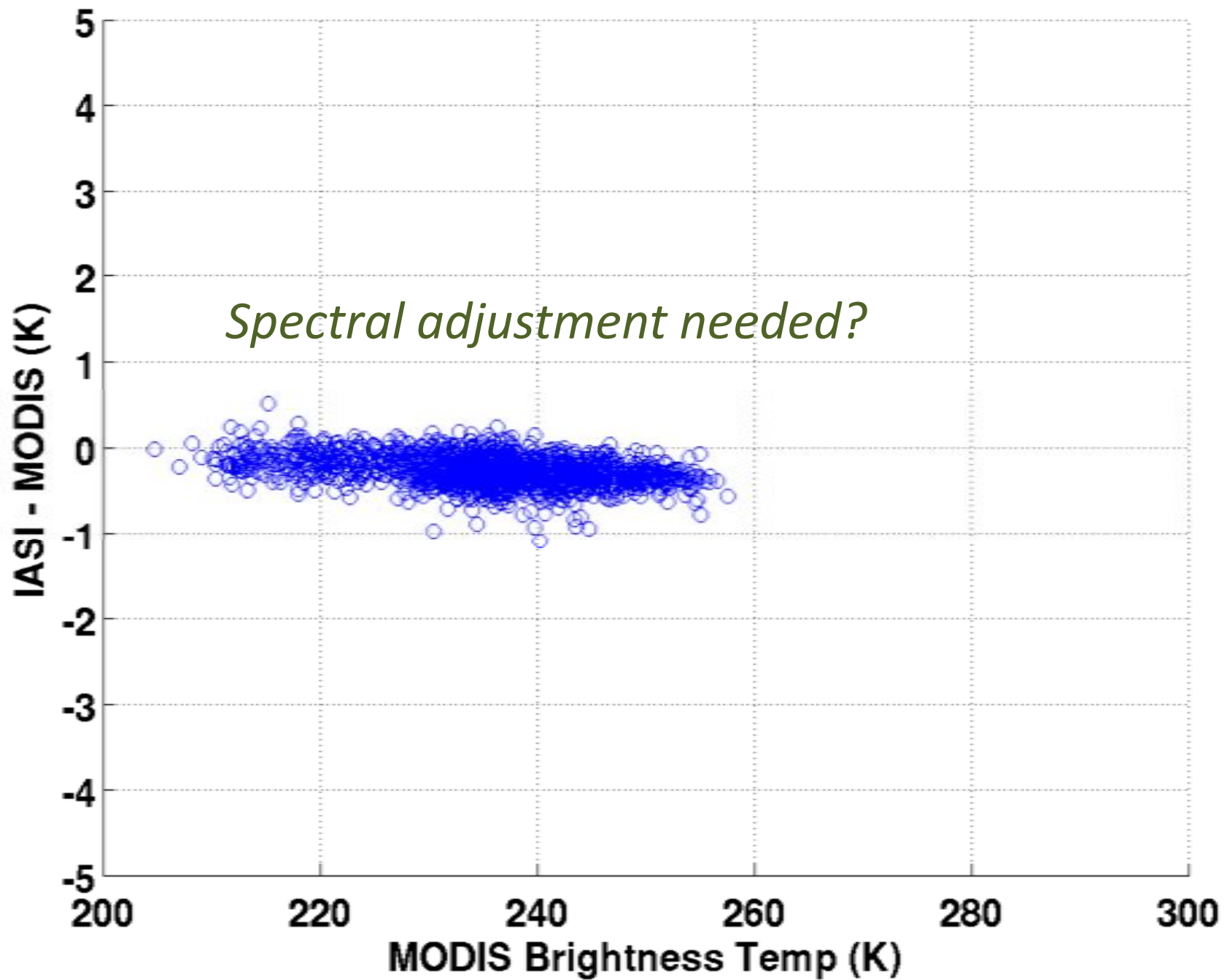
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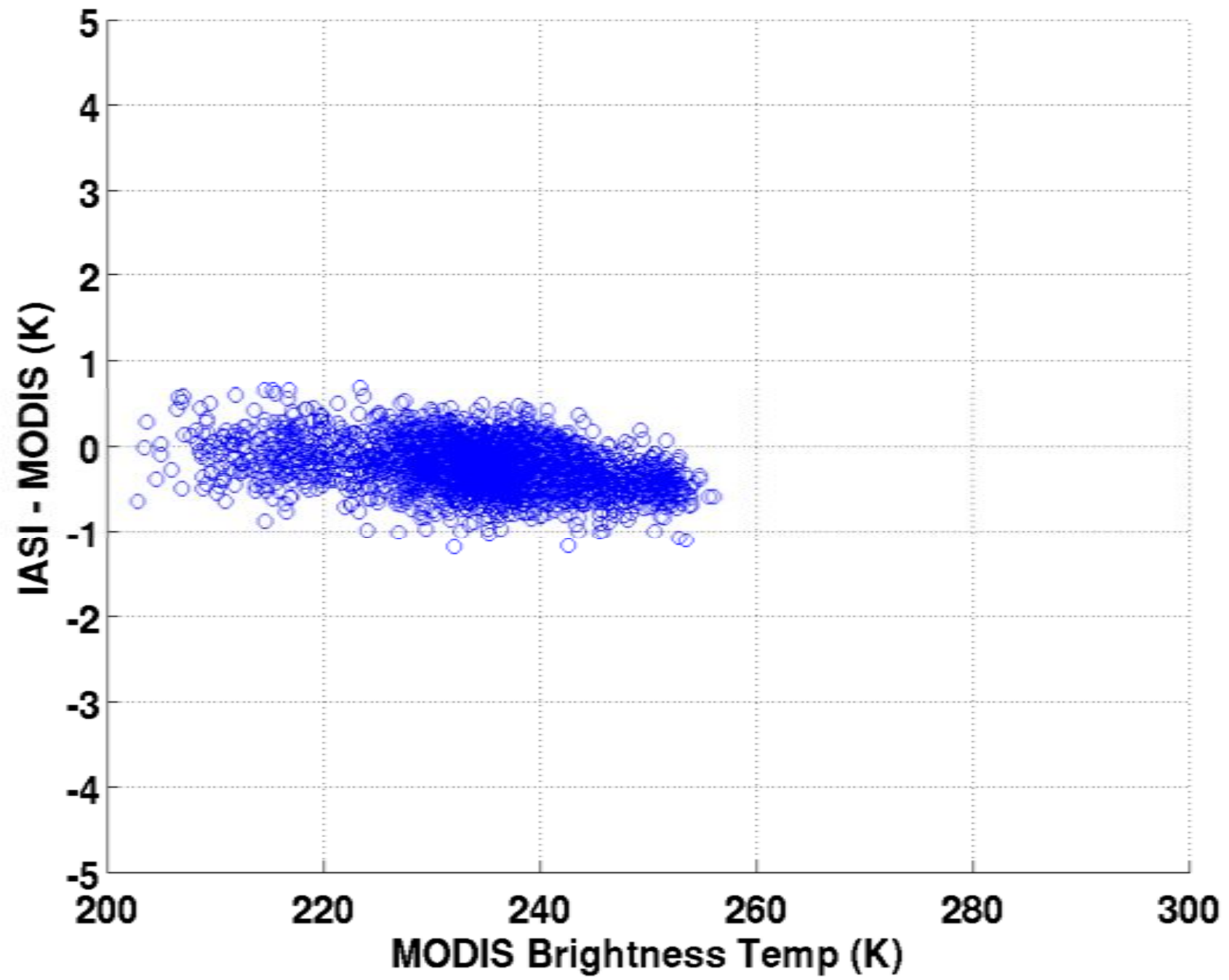
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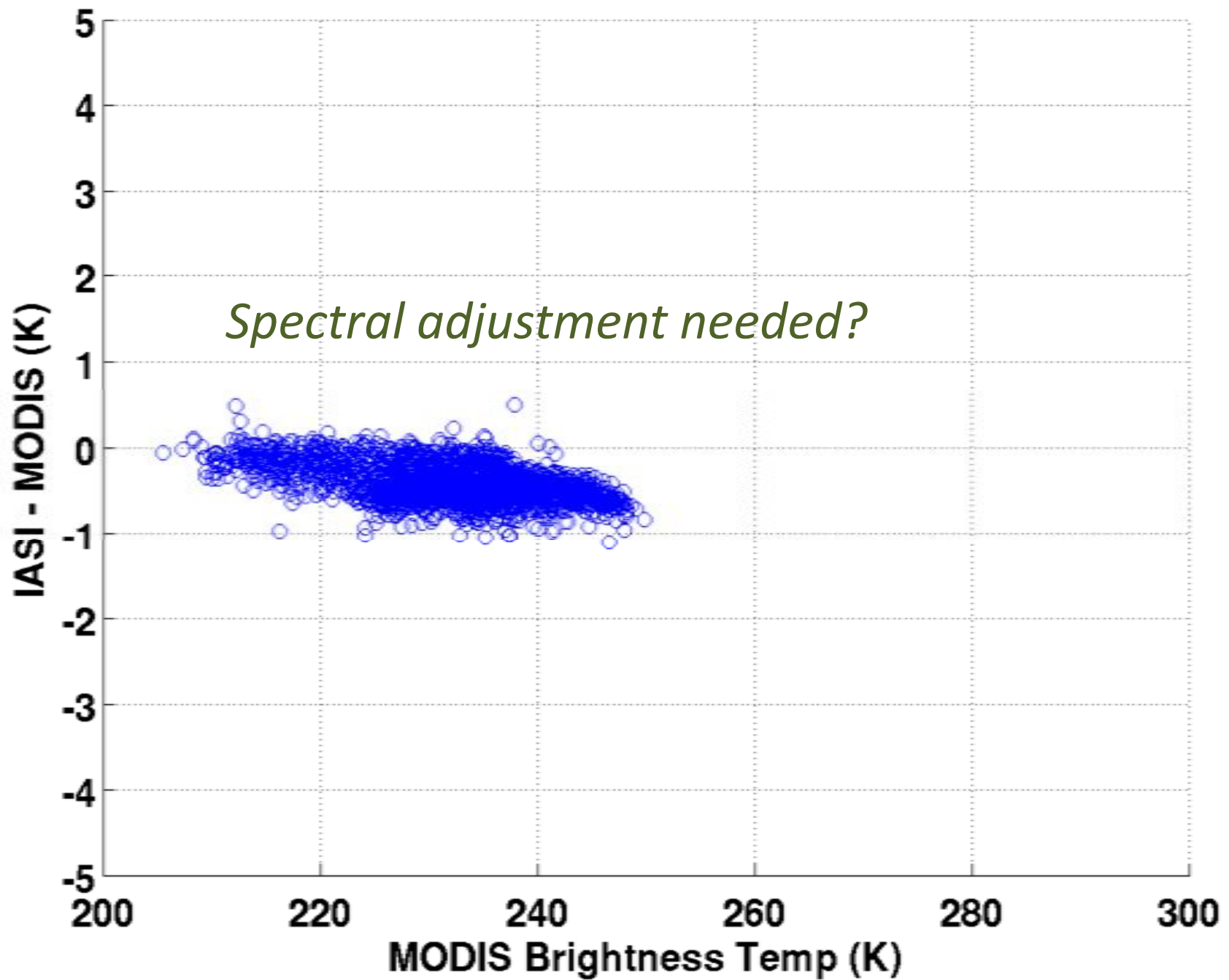
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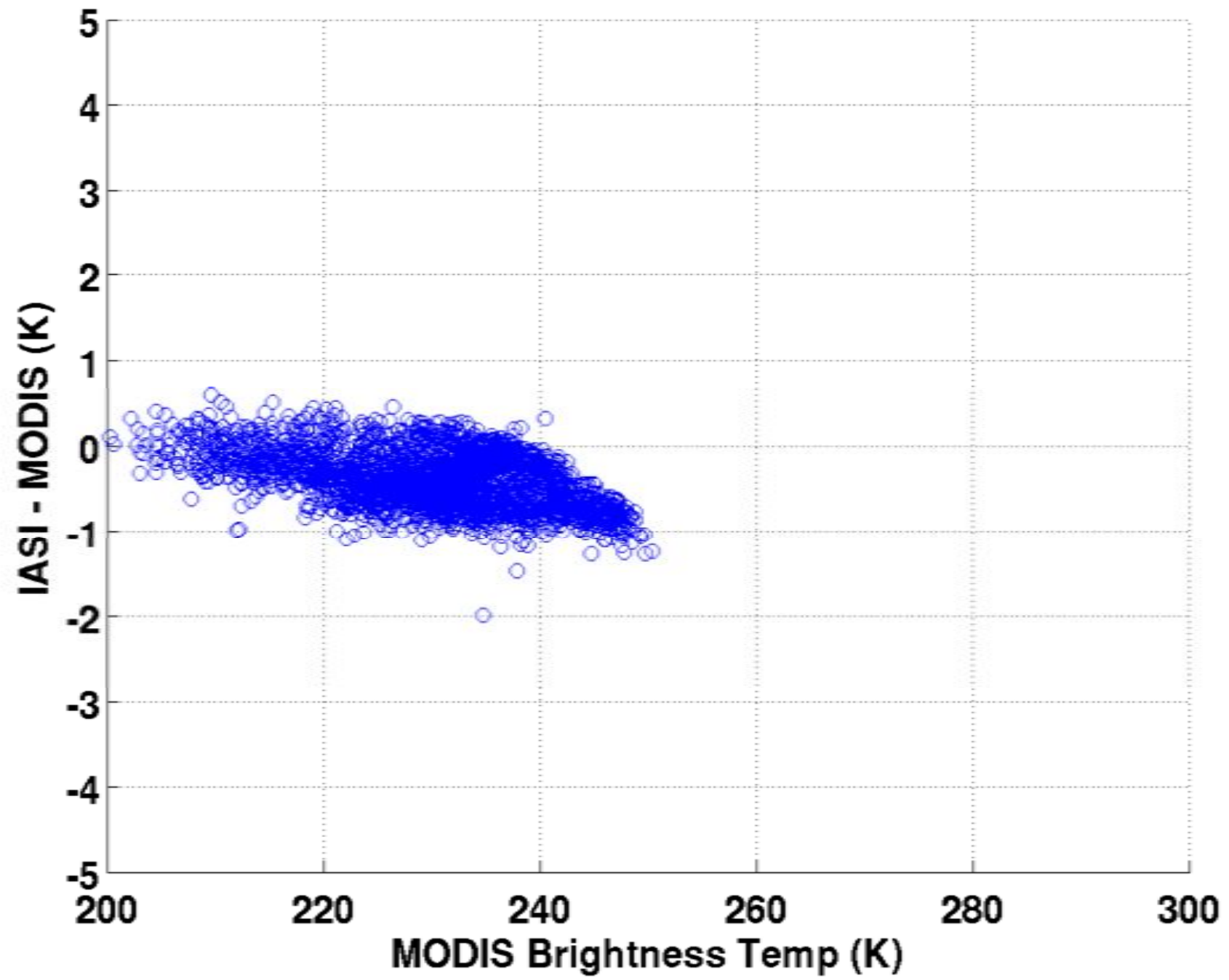
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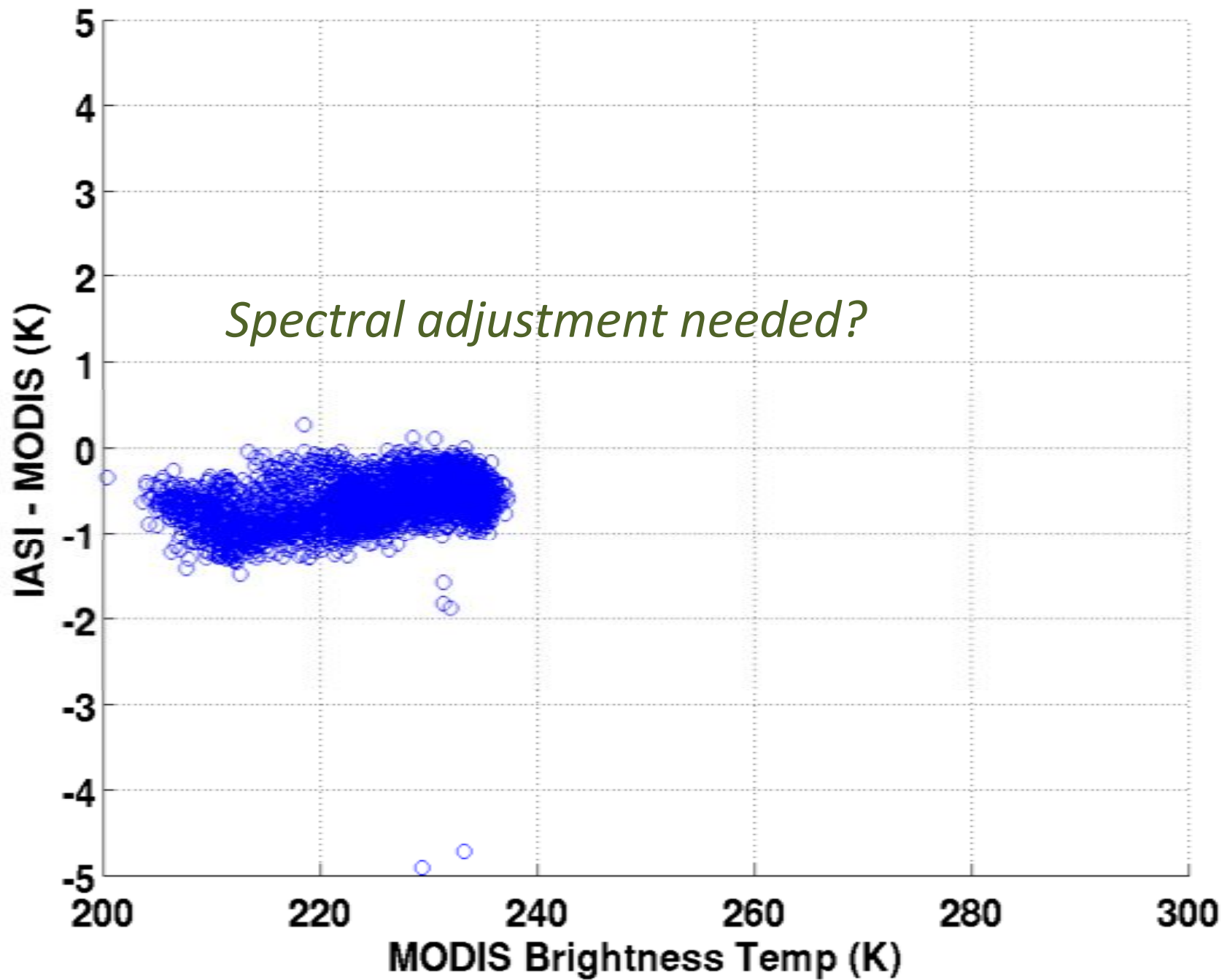
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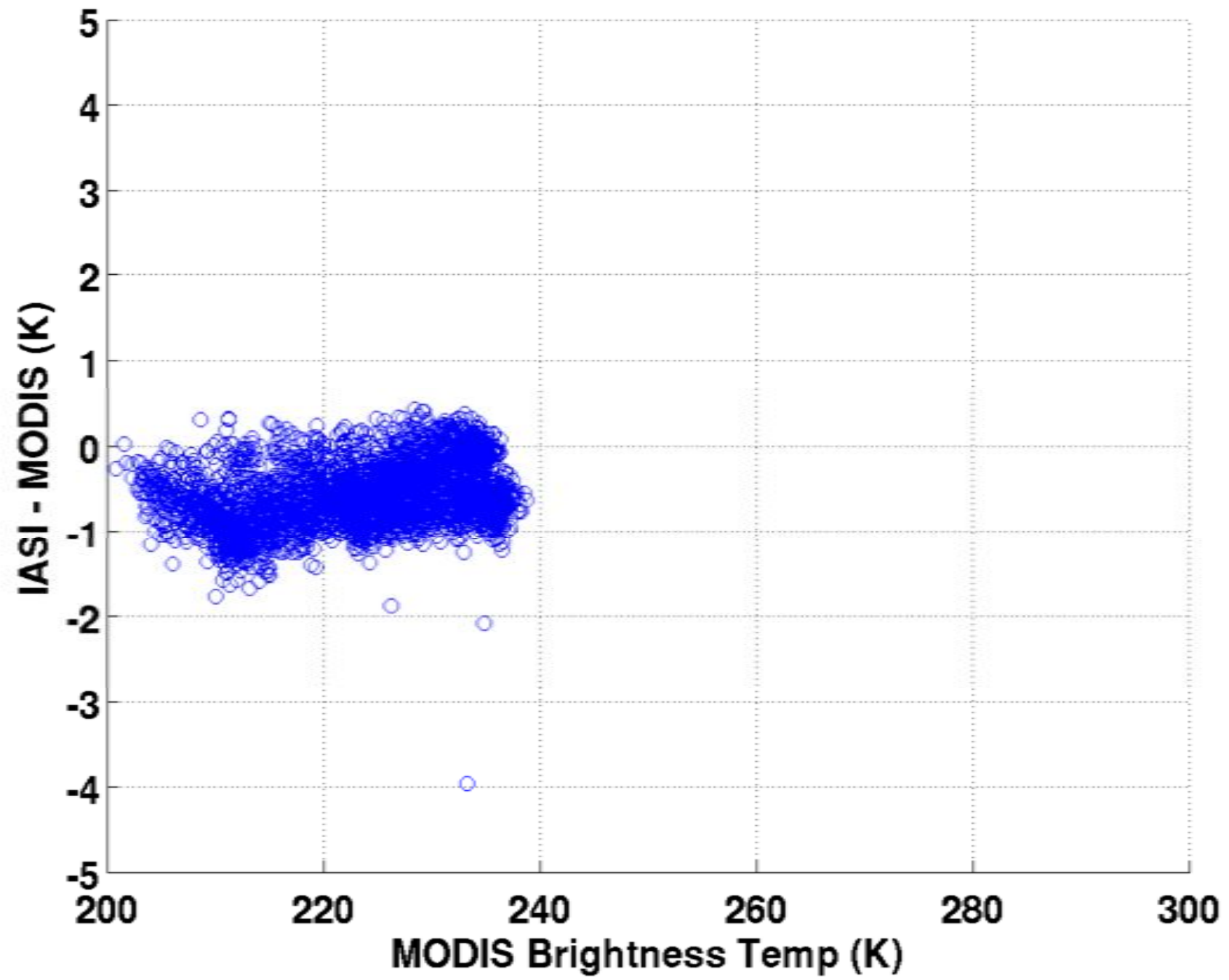
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2009 SNOs: IASI - Aqua MODIS Band 36 Det 5 MS 1



2009 SNOs: IASI - Terra MODIS Band 36 Det 5 MS 1



IASI – MODIS TEB Comparisons: Caveats and What's to Come

- IASI radiometric calibration has been shown to be high quality (similar to that of Aqua AIRS) but need to investigate to see if some of the scene temperature dependence may be due to IASI performance.
- This analysis uses only 2009 data. Other years should be processed to corroborate these findings.
- SNOs do not capture global variability of earth scenes nor sensor performance. Using full year of data mitigates this to some extent.
- AIRS-MODIS comparisons have suggested an effective spectral shift to MODIS bands 34-36. This shift will be applied to IASI-MODIS comparisons for corroboration.

Recommendation:

test new offset coefficients for Terra Bands 20 – 30 in attempt to explain Terra cold scene behavior.