Freeman Review of Dodson Proposal

Proposal Summary

The proposed work is to train an Artificial Neural Network (ANN) that can resolve broadband radiative fluxes (such as the ones calculated by CERES) from MODIS and to sharpen these predictions to MODIS resolution. The problem is well posed, and the methodology clearly links back to the objective.

Scientific Merit

Major Strengths:

The idea here is strong and clearly well thought out. I am not aware of another effort here to do this; this is great low-hanging fruit if it works.

Minor Strengths:

n/a

Minor Weaknesses:

n/a

Major Weaknesses:

n/a

Methodology

Major Strengths:

The methodology has been clearly thought out in detail. The methodology for estimating the broadband fluxes on the CERES grid from MODIS makes a great deal of sense, and the long, robust dataset helps you out quite a bit here.

Minor Strengths:

n/a

Minor Weaknesses:

I was less well convinced on the ability of the ANN to correctly represent the radiative fluxes on the native MODIS grid; I feel like that portion of the proposal could have been fleshed out more (although I recognize the space constraints).

Major Weaknesses:

n/a

Feasibility

Major Strengths:

The plan is straightforward and clearly well thought out.

Minor Strengths:

n/a

Minor Weaknesses:

This is quite a lot of data processing in a relatively short amount of time; I think a small proof-of-concept strategy first would help you out a lot here.

Major Weaknesses:

n/a

Commentary on proposal writing:

- Figure 2 was confusing- The text is small and I found myself staring at it for far too long to figure out what it was telling me.
- I have mixed feelings about the abstract at the top. On the ond hand, I

Other thoughts:

- This is an excellent, clearly well-thought-out proposal that has a clear objective and path forward.

- You might consider looking into using some airborne data as proxies/corroborating data for this. The MODIS/ASTER (MASTER) instrument was flown at the same time as some broadband radiometers that may be a point of comparison here.
- If CERES->MODIS works, consider using it on the TRMM CERES data as it's at higher resolution.

Overall Grade: A+