

A new dataset of rain cells generated from observations of the Tropical Rainfall Measuring Mission (TRMM) precipitation radar and visible and infrared scanner and microwave imager

Wu et al.

Summary

This paper presents a different method for defining “rain cells” using TRMM data, and publishes the new dataset for public use for meteorological studies. The method fuses TMI, PR, and VIRS data and uses a minimum bounding rectangle method to construct its features, as opposed to fitting ellipses, which has been the traditional method in the literature. Referring to other methods in the literature, there is already an extensive body of work constructing precipitation features with TRMM data, combining all three datasets. The authors reference this body of work but fail to describe how their dataset is an improvement beyond the state of the art. For this reason, I recommend rejection. I would recommend revision and resubmitting a paper in the same journal but selected as a method paper instead of a data paper, detailing how the MBR method is advantageous and presents a feature dataset beyond that which is already constructed by the Liu/Zipser groups and readily available.

Major Comments

Title: I would suggest removing the multiple “and”s and using commas

Literature: The background section reads as thoroughly as a textbook, going back to the 1970’s for a definition of a “rain cell” – the references need to be updated to more relevant sources and some discussion of the motivation behind a consistent definition of a “rain cell” is needed, here. Different scales and boundaries are useful for different reasons.

This paper discusses, disjointedly, the Precipitation Feature Databases constructed by the Liu/Zipser groups at the University of Utah and Texas A&M Universities at Corpus Christi. The PF database has evolved into a massive undertaking with cells of every size and strength, and defined by PR radar (RPFs), and passive-microwave polarization corrected temperature (PCTFs). Some focusing solely on precipitation, convection, MCSs, tropical cyclones, etc. They are freely available for download from <https://pps.gsfc.nasa.gov/> or <http://atmos.tamucc.edu/trmm/>.

While this manuscript references the dataset, it does not elucidate how the work advances the state of the art of constructing precipitation feature (or rain cell) databases, beyond trying a new boundary-definition method.

There are many other boundary definition methods currently used to define precipitating areas from satellite data, such as convex hull or K-means clustering. Many of the

Precipitation Features (PF) are defined using contiguous pixels, and do not require a bounding ellipse to be drawn.

It is not made clear in this manuscript how the authors' method advances this technique of defining features.

Minor Comments:

13 "Previous studies have mostly analyzed rain cells from a single radar data" This statement is false, there is a wealth of studies of rain cell (feature) database analysis from satellites.

17 Swath truncation: is this in reference to the ends of orbit files creating boundary artifacts? Or the edge of the swath on the sides cutting off features prematurely? It is not made clear in the rest of the manuscript.

28 Many journals do not allow citations in an abstract

33 suggest "the literature"

79 suggest "over East Asia"

83-84 How is what you have created different from previous datasets in the literature? Specifically, the PF database?

156 Please clarify if you are referring to the edge of the swath or the end of the orbit