

PDS Atlas Review

C R. Nugent, August 3, 2022

Major comments

General

- The data itself is lovely, and I appreciate you archiving it. This will enable a lot of great science!
- The documents are lacking sufficient detail to be useful to many researchers. A graduate student from another field (ex: exoplanets) reading this document would be confused by the hyper-specific terminology. They would benefit from more explanation, definition of acronyms, and references. The documents are lacking key details that are needed even for NEO researchers that have extensive background in this work. Without additional details, citations, and explanations, other researchers will not be able to extract full value from this work.
 - o It would be great to share the code (so the process was transparent even if the text was vague) or, if that's not possible:
 - o Improve existing documents, so that they have sufficient level of detail that the work can be reproduced by another researcher. There are relevant papers (e.g. Chyba Rabeendran & Denneau 2021, Smith et al. 2020) by the team, please summarize and reference them. Users need to know what was done, so they know what they can do with the data and how previous data processing might influence or bias their results. Additionally, it's useful to know what questions have been investigated using this data already, to avoid duplicated effort. For that reason, it is important to cite papers on the non-NEO science done with this data.

That being said,

- It seems as if each document was written by different people, and so there's overlap of information and a lack of clarity about which document covers which information. You may consider combining all into a single document, with a table of contents, to clearly organize the information for users.
- Something in the PDF conversion went astray that made the documents not searchable using Preview on mac OS. For example, try searching "document" in atlas_operations.pdf and you'll see there's no hits even though it is the second word. This search does work in Adobe Acrobat. Was this document created by Adobe Acrobat or another program (like Word?). Suggest using Adobe to create pdfs.

In atlas_bundle_overview.pdf

I appreciate the inclusion of text describing the data. However, this document could benefit from more explanatory detail of technical terms or more references, as appropriate. Some examples (not an extensive list)

- Many astronomers might not know what a “reduced image dophot detection catalog label” is off the top of their head. Please move the dophot description and reference up, so that it is defined before the table is described.
- A graduate student reading this might not know what a “full resolution column bias array” is
- In general, there is a lack of detail in how the cleaned image and variance planes were computed. It would be difficult for a researcher to duplicate your work (or fully understand how it was done) with the level of detail provided here. For example, what settings were used in dophot besides the five-sigma cutoff?
- What is the ATLAS tphot convention?
- How is atpants different than hotpants?
- The workings of “vartest” are opaque.
- Explain what a “Waussian fit” is
- Eliminate acronyms in column descriptions (ex: CCW), add in details of detection class to table (instead of in text), clarify what a Dup value of 2,-2 mean, etc.

In atlas_operations.pdf

This document could benefit from more explanatory detail of technical terms or more references, as appropriate. Some examples (not an extensive list)

- Combine Introduction section with text from other documents when making single file
- Which one is the “atlas telescopes document”? Can you add the filename?
- Missing reference in paragraph before “Image Subtraction”
- How does the scheduler algorithm work, in more detail?
- How close do you get to the moon when it is “avoided”?
- What language is the processing code written in? How long does it take to process an image?
- It’s great that this document explains what a Waussian is, so I don’t think it’s a typo again. But is there a reference? “Truncated at r^6 ” is not sufficiently clear.
- Can you show examples of tracklets accepted by human screeners and examples of rejected tracklets
- Again, the ATLAS deep machine learning code is not well described- what basic algorithm is used? What language is it in? What is the accuracy? False positive rate? False negative rate? (On more investigation, I found your paper on this! Please cite and provide summary).

















In image headers

Could you provide a description of the values in the header? For example:

- What is the “imstars tphot aprad” for example?
- What does it mean for anet distortion to be ok? Are there any images where it is not okay, and what does that mean for people using this data?

In data

- CSV files seem to be missing in some cases, see figure below.

	04a59613o0317o.fits	2022-06-22 11:56	446M
	04a59613o0317o.fits.fz	2022-06-22 12:35	113M
	04a59613o0317o.fits.xml	2022-06-22 12:17	80K
	04a59613o0317o.jpg	2022-06-22 13:01	947K
	04a59613o0318o.fits	2022-06-22 11:35	446M
	04a59613o0318o.fits.fz	2022-06-22 12:34	117M
	04a59613o0318o.fits.xml	2022-06-22 13:18	80K
	04a59613o0318o.jpg	2022-06-22 11:49	955K
	04a59613o0319o.fits	2022-06-22 11:16	446M
	04a59613o0319o.fits.fz	2022-06-22 13:19	111M
	04a59613o0319o.fits.xml	2022-06-22 13:22	80K
	04a59613o0319o.jpg	2022-06-22 11:31	876K
	04a59613o0320o.fits	2022-06-22 11:48	446M
	04a59613o0320o.fits.fz	2022-06-22 12:27	108M
	04a59613o0320o.fits.xml	2022-06-22 11:21	80K
	04a59613o0320o.jpg	2022-06-22 11:09	833K

- "Type" in dph files needs to be 'type' following document and convention of non-capitalization used elsewhere- just be consistent please.

Minor comments

These comments are meant to be helpful and are either suggestions or minor revisions.

General

- Why are both fits and fits fpack being archived? Fits fpack is the standard for NEAT. Wouldn't it be cheaper/easier to just archive the fits fpack images?

In atlas_bundle_overview.pdf

- "Only the object exposures, are being archived to PDS." remove comma.
- "The following table" -- this text is duplicated.

In atlas_history.pdf

- Please define "very close approaching asteroids"
- "The Willow tree" -> "The Willow" (wouldn't the willow tree be *el árbol sauce?*)
- Can collaborators be named?

In atlas_operations.pdf

- Update "Figure X"

In CSV files

- Consider using a header indicator (for example, '#'), and including a second row with units and a third row with a description of the quantity. Having all the information in one place is easier for users.