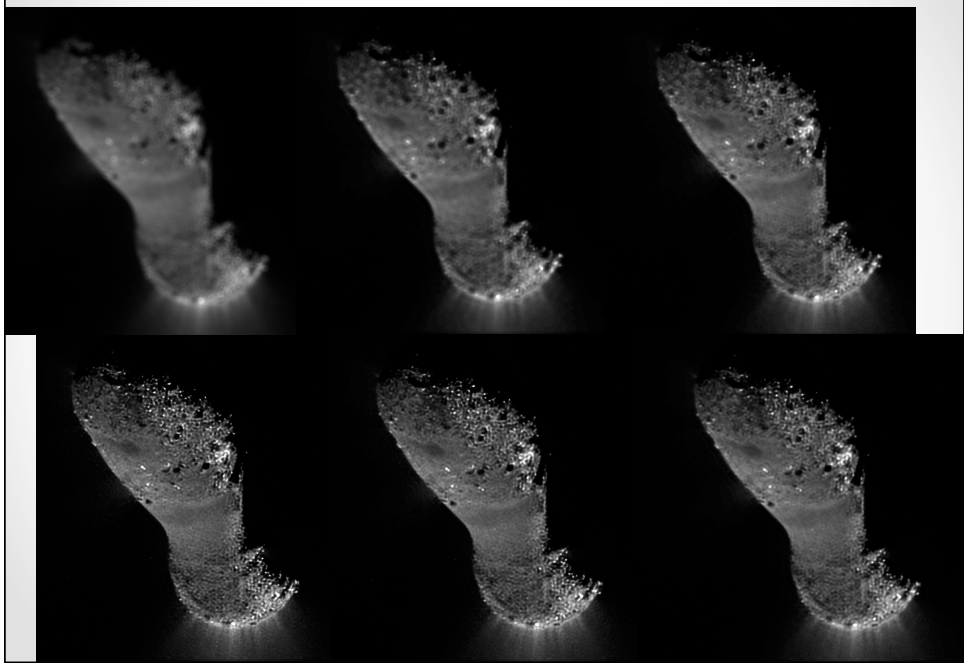
EPOXI HRIV Hartley 2 Deconvolved Images

- Hartley 2 HRIV Deconvolved images within ±1 hr of close encounter
- With Richardson-Lucy method for 25, 50, 100, 200, 400 iterations
- Original images and PSFs used are all documented
- Images can be loaded and displayed in correct orientation with both SAOImage and IDL. FITS extensions loaded well.
- Generally a good dataset, with minor suggestions

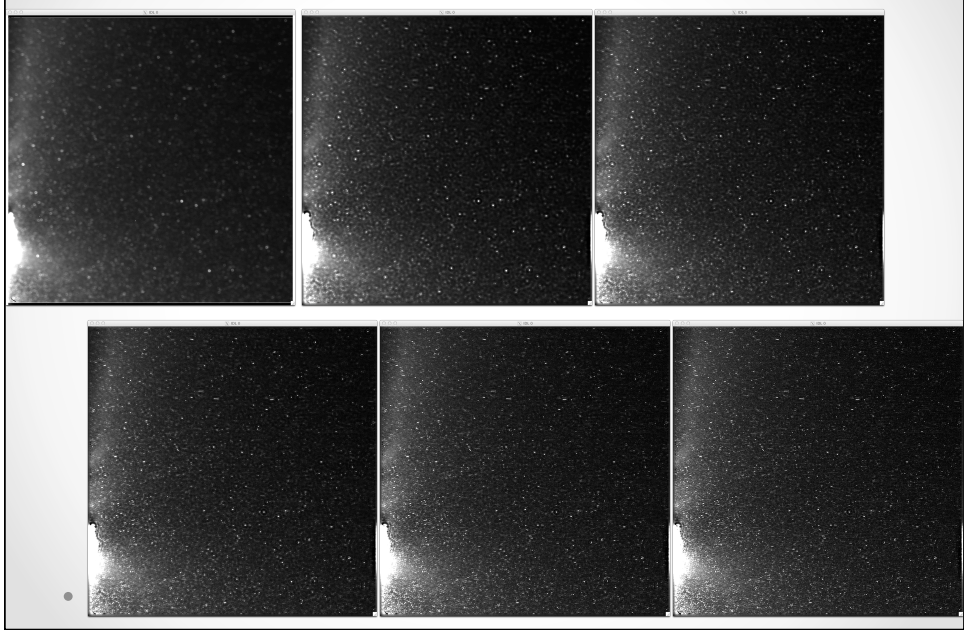
Review Summary

- Several questions should be addressed in the dataset description or documentation:
  - Why this deconvolution algorithm?
  - What are the pros and cons?
  - Is photometry generally preserved?
  - How to judge what images are the best for various purposes?
  - What should users be cautious about when using the deconvolved images
- Suggest including Lindler's paper in the dataset, if not substantially expand the dataset description
- Some other documentation issues
  - In deconv_image_parameters.tab: columns 27-30 are intended for sub-s/c and sub-solar coordinates, but all -88.88. The values are easy to cause confusions. Suggested either remove, or replace with meaningless values such as -999.
  - Column 33, the meaning of "partial saturated pixel" is not clear
- aareadme.txt:
  - Line 72: Duplicated section of /DATA/ directory

hv10110413_5004008_001



hv10110413_5004024_001



Review Recommendation

- Certified, but revisions are required to resolve the minor liens
- No need to review the revision again

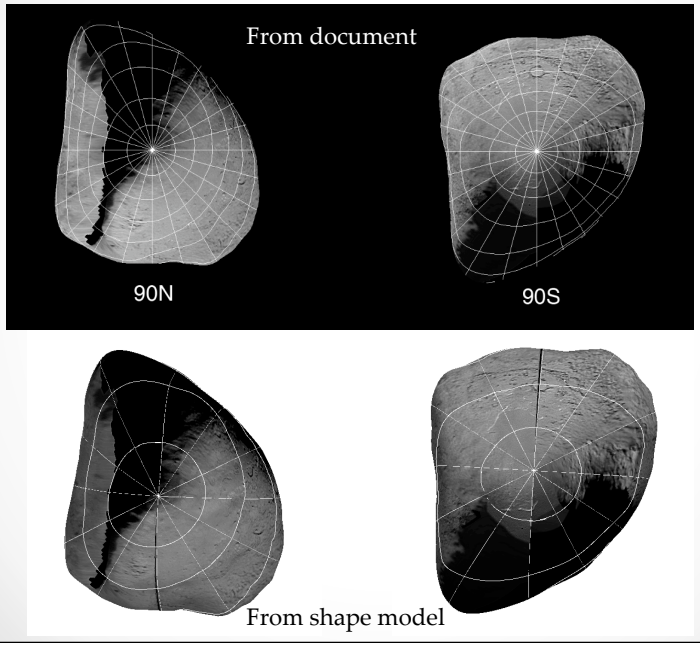
Tempel 1 Shape Model

- Shape model of Tempel 1 as derived from DI data and NExT data
- Overall the documentation is fine, with some minor suggestions to improve
  - All references in the NExT/EPOXI special issue needs to be updated
  - The consistency of numbers in documents needs to be checked
- Some peculiarity in the shape model needs to be either resolved of documented
  - Pixelization in the VRML format
  - Flags appear to be suspicious in some places

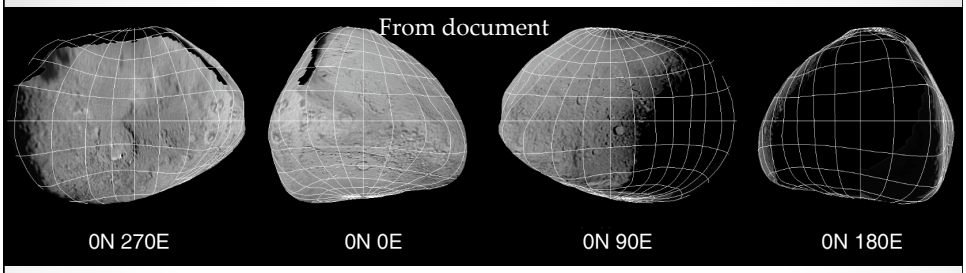
Tempel 1 Shape Model

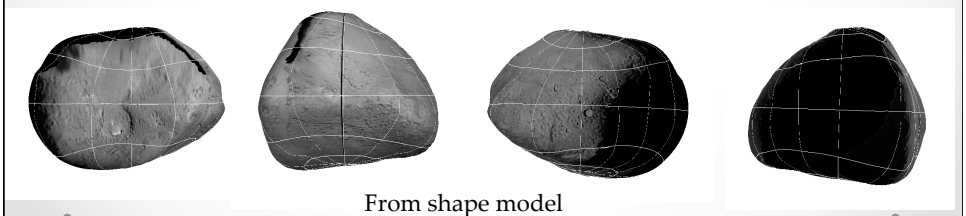
- catalog/dataset.cat:
  - Line 83: Center of figure not coincident with the origin...to be corrected in future version?
  - Needs to define A/B/C
- Check numbers in dataset.cat
  - Area 108 vs 108.5
  - Volume: 95.2 vs 95.2
  - Mean Radius: 2.83 vs 2.68
  - Radius range: 2.10-3.97 vs 2.10-3.97
  - Line 141: Not diameter range but radius range
  - Generaly good agreements between the listed values in the file (first) and my calculation (second)
  - But some discrepancies exist, especially for mean radius

Visualization of shape model:

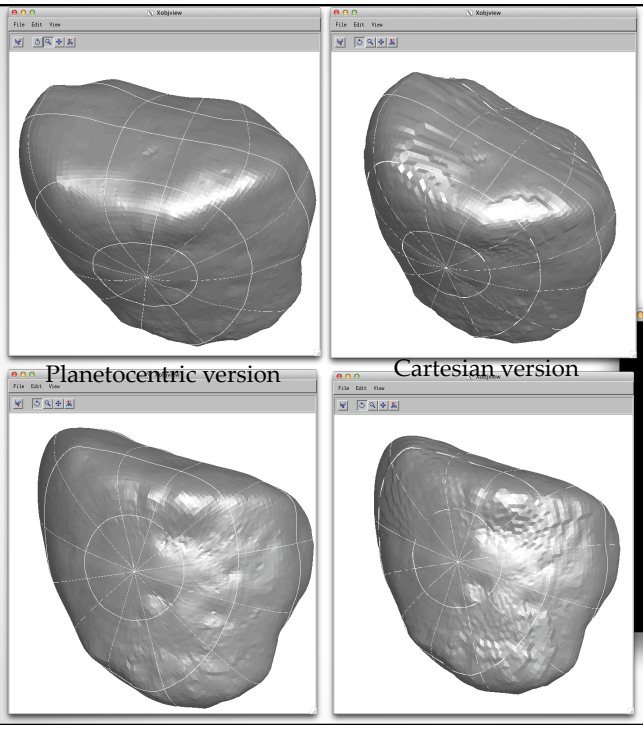


Visualization of shape model:



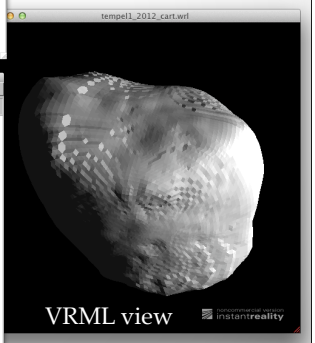


From shape model



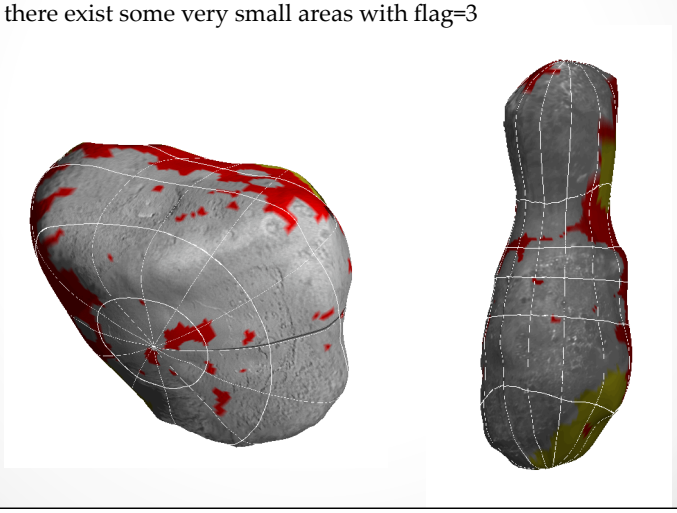
VRML Format:

- Pixelization
- Degradation of resolution



Some flag 3 may not be correct

- Yellow – flag=2
- Red – flag=3
- When flag=3, it is 0.4 km away from flag=1 or 2 for Tempel 1, 0.11 km away for Hartley 2
- But there exist some very small areas with flag=3



Minor Suggestions

- aareadme.txt
  - Lines 62, 63: Suggest replace "refs" by full spelling "references"
- catalog/catinfo.txt:
  - Line 89: PERSONNEL.CAT is not in the directory, despite that this file says it is. The description of PERSONNEL.CAT should probably also mention DI mission.
  - Line 42: REFERENCE.CAT is mentioned, but it should be ref_next.cat and ref_di_epoxi.cat

Minor Suggestions

- catalog/dif.cat:
  - Line 30: Revise the sentence: not "presently being used"
  - Last paragraph in "Instrument Host Overview": Should it be moved up because the previous contents are all in chronological order?
  - Section about "Safe Mode and Telecom Anomaly": What is the purpose of this section? There must be other safes but why only these two were discussed here?
  - Last paragraph should be removed as the mission ends.
- catalog/hriv.cat, its.cat, mri.cat:
  - Discussions about the 1/3 pixel gap: is it also worth to reference to the photometric dataset that contains the documentations on the photometric correction as an example?
- catalog/next.cat:
  - Is formal mission name "Stardust-NExT" or "NEXT".

Minor Suggestions

- document/tempel1_shape_description.asc:
  - Line 19: Numbers of vertices and plates are not consistent with those in the actual model
  - Coincidence of center of figure and coordinate origin
  - Line 33: Add uncertainty for flag 2 (~100 m as in dataset.cat)
  - Line 66: Mention the downsampling of vertices for high latitude areas in cart version from plan version
  - Line 110: The image file format is PNG as in the dataset, not TIF as in this document. Also need to check the consistency of file names, e.g., tempelviews_gridded.tif vs tempel1views_gridded.png

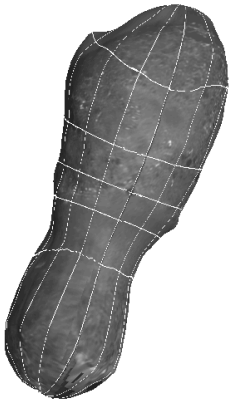
Review Recommendation

- Can be certified
  - The shape model data file in planetocentric coordinates is good to use
  - Documentation contains sufficient information for scientific use under support from producer
  - Include a note in the certification that the VRML format needs some more tweak
- Revision has to be taken
  - The discrepancy between planetocentric version and VRML version has to be resolved
  - The documentation of flags has to be updated
  - Documents needs to be improved

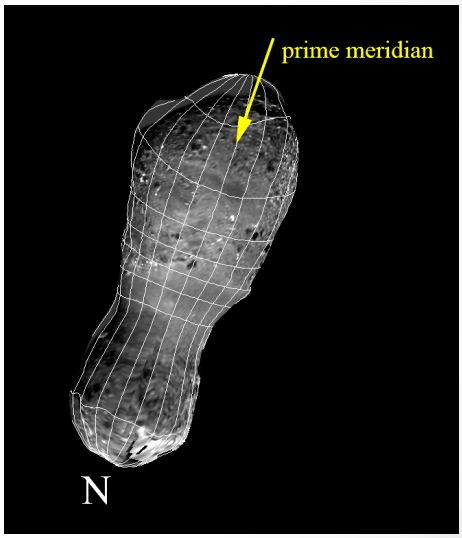
Hartley 2 Shape Model

- Shape model of Hartley 2 as derived from EPOXI data
- Overall the documentation is fine, with some minor suggestions, similar to Tempel 1 shape model, to improve
  - All references in the NExT/EPOXI special issue needs to be updated
  - The consistency of numbers in documents needs to be checked
- Similar peculiarity in the shape model as for Tempel 1 dataset
  - Pixelization in the VRML format
  - Flags appear to be suspicious in some places

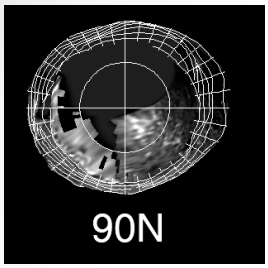
From shape model

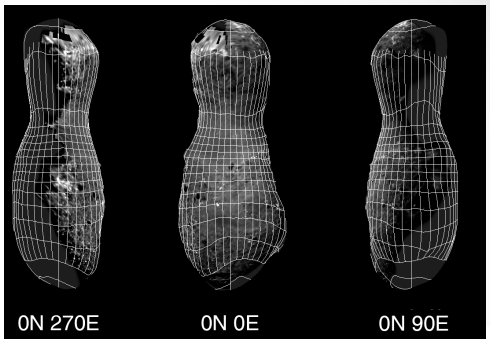


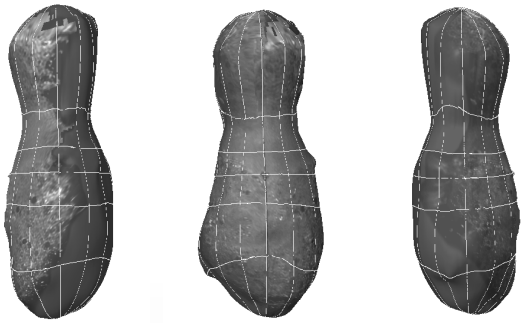
From document



From document



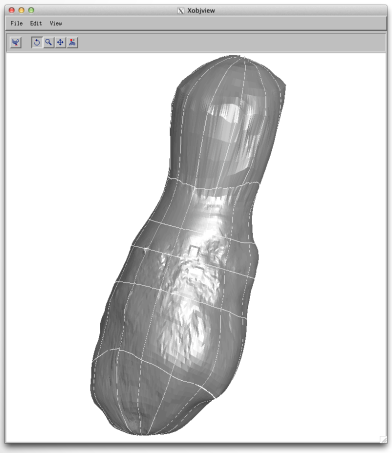




From shape model

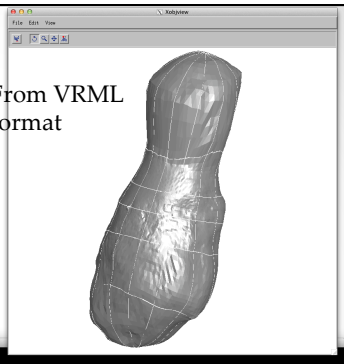
VRML Format:

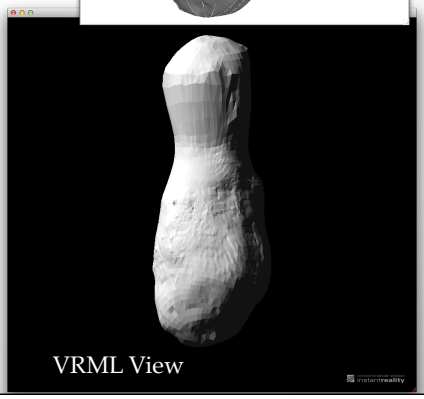
Pixelization
Degradation of resolution



From planetocentric coordinates

From VRML format





VRML View

Minor Suggestions

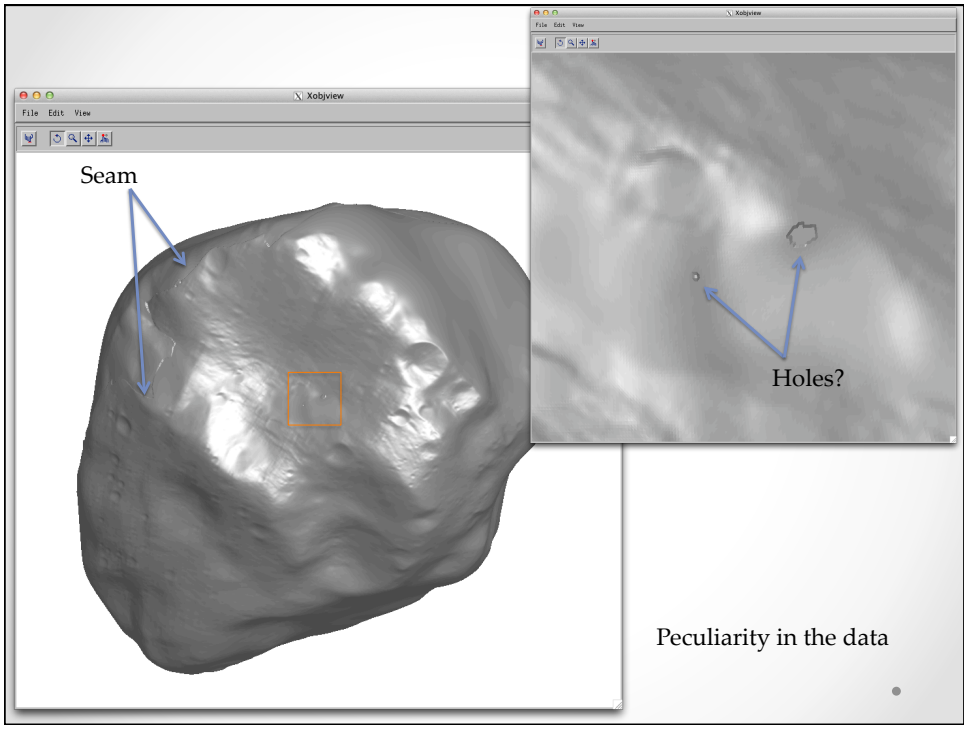
- catalog/catinfo.txt:
  - Line 36 and 69: PERSONNEL.CAT is not included in the directory, but mentioned in this file. The description is wrong
  - Line 36: REFERENCE.CAT is mentioned, but it should be ref_epoxi.cat.
- catalog/dataset.cat:
  - Line 43: Update reference Thomas et al., 2013
  - Line 65: Any reasons why the center of figure is offset from the coordinate origin?
  - Line 71: Reference to Belton et al., 2013 needs to be updated
  - Define A/B/C
- Check numbers:
  - Area: 5.24 vs 5.24
  - Volume: 0.809 vs 0.810
  - Mean radius: 0.58 vs 0.62
  - Diameter range: ... Radius range 0.31 - 1.26
- document/hartley2_shape_description.asc:
  - Line 72: Make the file name consistent

Review Recommendation

- Can be certified
  - The shape model data file in planetocentric coordinates is good to use
  - Documentation contains sufficient information for scientific use under support from producer
  - Include a note in the certification that the VRML format needs some more tweak
- Revision has to be taken
  - The discrepancy between planetocentric version and VRML version has to be resolved
  - The documentation of flags has to be updated
  - Documents needs to be improved

Lutetia Shape Model

- catalog/catinfo.txt
  - Line 37, check consistency of file names: REFERENCE.CAT as in this file and references.cat (extra s) as in the directory
  - Line 38: No personnel.cat file found in the directory
- catalog/dataset.cat:
  - The dimensions are obviously wrong. My calculation has A=111.3, B=121.1, C=84.8
  - Discrepancy in area: 33331 in dataset.cat, and 33318 by myself
- Documents
  - Recommend expanding the documents to include 1) views from s/c at various times during the flyby and 2) standard view point with lat-lon grid overlain
- Data:
  - An obvious seam as Tony noticed. Need documentation on it.
  - Related to the seam and "two methods used" mentioned in the dataset, it will be userful to document what method was used for what areas



Steins Shape Model

- catalog/catinfo.txt:
  - Line 37: Check consistency of file name: REFERENCE.CAT vs references.cat (extra s)
  - Line 38: No personnel.cat file fund in the directory
- Numbers in catalog/dataset.cat:
  - Area 92 vs 92.5
  - Mean rad 2.70 vs 2.59
  - Dimensions: 6.83x5.70x4.42 vs 6.81x5.62x4.20
  - Need a reference for rotational period
- Documents
  - Recommend expanding the documents to include 1) views from s/c at various times during the flyby and 2) standard view point with lat-lon grid overlain
- Data:
  - An obvious seam as Tony noticed. Need documentation on it.
  - Related to the seam and "two methods used" mentioned in the dataset, it will be userful to document what method was used for what areas

Seams between two halves