

129 asteroid diameters that were presented as new thermal model fits in the NEOWISE papers [Masiero et al. 2011](#), [Mainzer et al. 2011](#), and in the [NASA Planetary Data System](#) were not actually produced by thermal modeling.

These values were copied from a dozen or so earlier publications that reported diameter estimates made by observing asteroids with radar or spacecraft, or by timing the dimming of a star when an asteroid passes in front of it (so-called occultation diameters).

Excerpt of Table 1 from [Masiero et al. 2011](#)

Table 1
Example of Electronic Table of the Thermal Model Fits

Object	H	G	D	p_V	η	p_{IR}	# obs (W1-W4)
00002	4.060	0.11	544.000 ± 42.916	0.1417 ± 0.0195	0.938 ± 0.049	0.0961 ± 0.0229	11 11 11 0
00002	4.060	0.11	544.000 ± 60.714	0.1419 ± 0.0456	0.774 ± 0.074	0.0816 ± 0.0155	11 11 8 0
00005	6.850	0.15	115.000 ± 9.353	0.2451 ± 0.0509	0.994 ± 0.065	0.3313 ± 0.0669	9 13 13 13
00006	5.710	0.24	185.000 ± 10.688	0.2685 ± 0.0488	0.840 ± 0.061	0.3810 ± 0.0346	14 14 14 13
00008	6.350	0.28	140.000 ± 1.160	0.2614 ± 0.0484	0.794 ± 0.029	0.4348 ± 0.0453	15 17 16 17
00009	6.280	0.17	204.528 ± 3.671	0.1300 ± 0.0184	1.059 ± 0.012	0.2665 ± 0.0366	15 15 14 15
00009	6.280	0.17	190.791 ± 4.901	0.1493 ± 0.0343	0.878 ± 0.026	0.3144 ± 0.0188	10 10 10 10
00010	5.430	0.15	453.239 ± 19.244	0.0579 ± 0.0051	0.928 ± 0.026	0.0648 ± 0.0054	11 11 6 0
00011	6.610	0.15	159.108 ± 5.944	0.1585 ± 0.0365	0.937 ± 0.048	0.2923 ± 0.0298	9 10 9 10
00012	7.240	0.22	126.643 ± 3.199	0.1400 ± 0.0137	0.947 ± 0.026	0.2818 ± 0.0341	17 19 14 21
00013	6.740	0.15	227.000 ± 25.948	0.0690 ± 0.0218	0.894 ± 0.139	0.0443 ± 0.1426	0 4 4 8

(This table is available in its entirety in a machine-readable form in the online journal. A portion is shown here for guidance regarding its form and content.)

The duplication, which was not acknowledged in these papers, makes it impossible to verify the true accuracy of the NEOWISE thermal models from the published data.

Excerpt of Table 1 from [Schevchenko and Tedesco 2006](#)

Table 1

Aspect data of asteroids and results of calculations

Asteroids	Date	α	λ_{2000}	β_{2000}	Class	D_{Occ}
1 Ceres	1984 Nov 13.19653	3.4	46.781	-8.657	G?,C	933
2 Pallas	1978 May 29.22569	14.3	254.929	48.451	m,B	544
	1983 May 29.20674	15.4	293.711	43.351	m,B	522

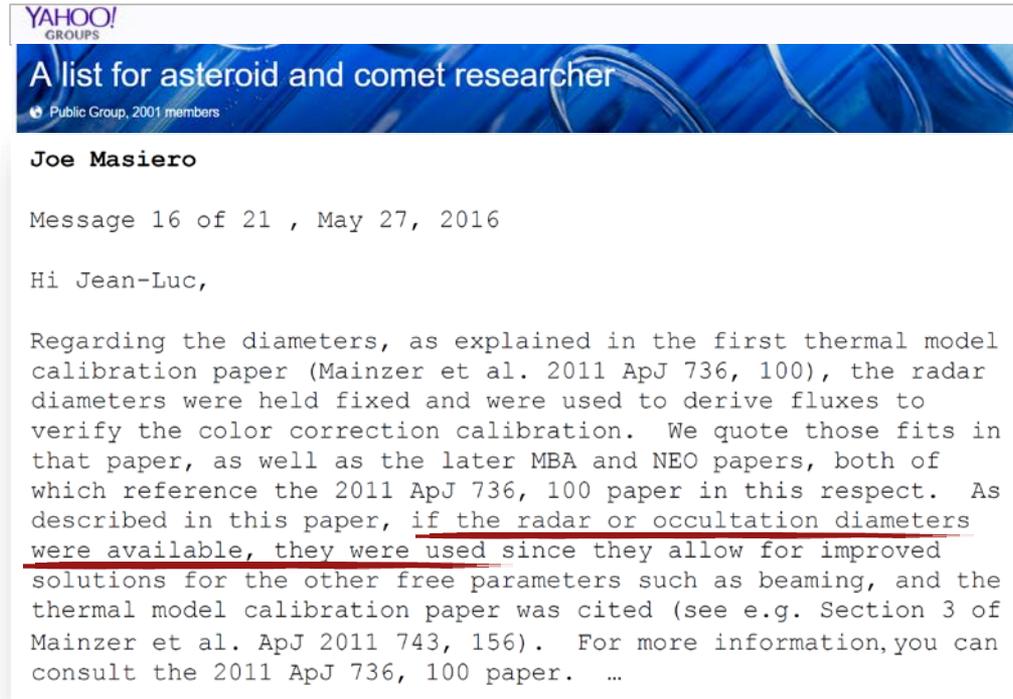
Excerpt of Table 3 from [Durech et al. 2009](#)

List of results

Asteroid	D [km]	λ_p [deg]	β_p [deg]	P [hr]	D_{IRAS} [km]
2 Pallas	539 ± 28	35	-12	7.81323	498 ± 19
3 Juno	252 ± 29	103	27	7.209531	234 ± 11
5 Astraea	115 ± 6	126	40	16.80061	119 ± 7
6 Hebe	180 ± 40	340	42	7.274471	185 ± 3

After a [preprint](#) appeared on arXiv.org pointing out this issue, the lead author of [Masiero et al. 2011](#) acknowledged, in response to a question from an astronomer at UCLA in a Yahoo message

board, that previously published radar and occultation diameters were indeed inserted into the data set whenever they were available.



The image is a screenshot of a Yahoo! Groups message. At the top, the Yahoo! Groups logo is visible. Below it, the group name "A list for asteroid and comet researcher" is displayed, along with the information "Public Group, 2001 members". The sender's name, "Joe Masiero", is shown in bold. The message is dated "Message 16 of 21 , May 27, 2016". The body of the message is a plain text email-style message addressed to "Hi Jean-Luc,". The main text discusses the use of radar and occultation diameters in a paper by Mainzer et al. (2011 ApJ 736, 100). A specific sentence is underlined in red: "if the radar or occultation diameters were available, they were used since they allow for improved solutions for the other free parameters such as beaming, and the thermal model calibration paper was cited (see e.g. Section 3 of Mainzer et al. ApJ 2011 743, 156). For more information, you can consult the 2011 ApJ 736, 100 paper. ...".

YAHOO!
GROUPS

A list for asteroid and comet researcher
Public Group, 2001 members

Joe Masiero

Message 16 of 21 , May 27, 2016

Hi Jean-Luc,

Regarding the diameters, as explained in the first thermal model calibration paper (Mainzer et al. 2011 ApJ 736, 100), the radar diameters were held fixed and were used to derive fluxes to verify the color correction calibration. We quote those fits in that paper, as well as the later MBA and NEO papers, both of which reference the 2011 ApJ 736, 100 paper in this respect. As described in this paper, if the radar or occultation diameters were available, they were used since they allow for improved solutions for the other free parameters such as beaming, and the thermal model calibration paper was cited (see e.g. Section 3 of Mainzer et al. ApJ 2011 743, 156). For more information, you can consult the 2011 ApJ 736, 100 paper. ...

Around the same time, Masiero uploaded the NEOWISE diameters to the NASA Planetary Data System (PDS). The documentation for that release claimed that the diameters inserted into the PDS were simply compiled from the previous NEOWISE papers, and that each entry in the database was referenced to a source paper.



NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION



Planetary Data System

NEOWISE Diameters and Albedos

This PDS data set represents a compilation of published diameters, optical albedos, near-infrared albedos, and beaming parameters for minor planets detected by NEOWISE during the fully cryogenic, 3-band cryo, post-cryo and NEOWISE-Reactivation Year 1 operations. It contains data covering near-Earth asteroids, Main Belt asteroids, active Main Belt objects, Hildas, Jupiter Trojans, Centaurs, and Jovian and Saturnian irregular satellites. Methodology for physical property determination is described in the referenced articles.

EAR_A_COMPIL_5_NEOWISEDIAM_V1_0 [Browse](#) [Download \(6.0 Mb\)](#)

Use the following citation to reference this data set:

"Mainzer, A.K., Bauer, J.M., Cutri, R.M., Grav, T., Kramer, E.A., Masiero, J.R., Nugent, C.R., Sonnett, S.M., Stevenson, R.A., and Wright, E.L., NEOWISE Diameters and Albedos V1.0. EAR-A-COMPIL-5-NEOWISEDIAM-V1.0. NASA Planetary Data System, 2016."

<https://sbn.psi.edu/pds/resource/neowisediam.html>

The PUBLISHED_LITERATURE designation for INSTRUMENT_HOST is used when the data presented in a given data set were collected entirely by referencing results published in the literature. The data set description or product labels will provide the explicit references, which in turn should provide details of the original observing campaigns, data reduction, or criteria for inclusion for each datum reported in the PDS data set."

https://sbn.psi.edu/pds/asteroid/EAR_A_COMPIL_5_NEOWISEDIAM_V1_0/catalog/publithost.cat

But a comparison of the diameters values in the PDS to those in the NEOWISE papers reveals that nearly 4,000 diameters from the papers (including all but nine of the copied diameters) were left out of the PDS.

More than 1,000 new diameters were added but misattributed to papers in which they never appeared.

And the values of more than 200 diameters were altered without explanation.

The origin of these new and altered diameters has not been explained by the NEOWISE team.

Entries for asteroids 2 to 13 in...

Masiero et al. 2011

Name	dia
2	544
2	544
5	115
6	185
8	140
9	204.528
9	190.791
10	453.239
11	159.108
12	126.643
13	227

Masiero et al. 2014

Name	Dia
5	108.290
6	195.640
8	147.490
9	183.010
9	184.160
11	142.890
12	115.090

NASA Planetary Data System

ASTEROID_NUMBER	DIAMETER	REFERENCE
2	642.959	Mas14
2	610.818	Mas14
3	246.596	Mas12
3	337.857	Nug15
5	108.293	Mas14
5	106.699	Mas12
6	195.639	Mas14
6	197.871	Nug15
7	220.209	Nug15
8	147.491	Mas14
8	169.354	Nug15
9	183.011	Mas14
9	184.158	Mas14
10	533.302	Mas14
11	142.887	Mas14
11	154.125	Mas12
12	115.087	Mas14
12	138.639	Nug15
12	133.318	Nug15
13	222.792	Mas11
13	202.636	Nug15

