Comet Afrho Review

PDS4

Yuna Kwon, Oct 16, 2025

Overview.txt

of Unique Comets

The database collects 4350 measurements of the Afρ parameter of 334 comets from various families, taken from about 100 papers.

- Confirmed: 4350 measurements
- **Checks required**:
  - # of unique comets from the original ‘comet name’ column: 346
  - Some comets have a ‘—‘ inconsistency:

```
'29P/Schwassmann-Wachmann 1',
'29P/Schwassmann-Wachmann–1',
```

    - Fixing this typo still gives 339
  - Additional typos:

```
'137P/Schoemaker Levy 2',
```

```
'45P/Honda Mrkos Pajdesakova',
'45P/Honda Mrkos Pajdusakova',
```

```
'C/2012 K1 (PANSTARRS)',
'C/2012 K1 (PANSTARRS) ',
```

  - What about fragments? etc.

Overview.txt

Gas-to-dust ratio

When collecting data, we took into account the effects of the used aperture size, filters or wavelengths, and contamination of gaseous emissions by adding to the database the respective values that characterize them.

- Confirmed: unique list of ‘yes’ and ‘no’
- **Suggestion**: If “yes” (1939 measurements), you may want to provide a specific value as a database.

db_dust_activity_level

Data Sanity Check

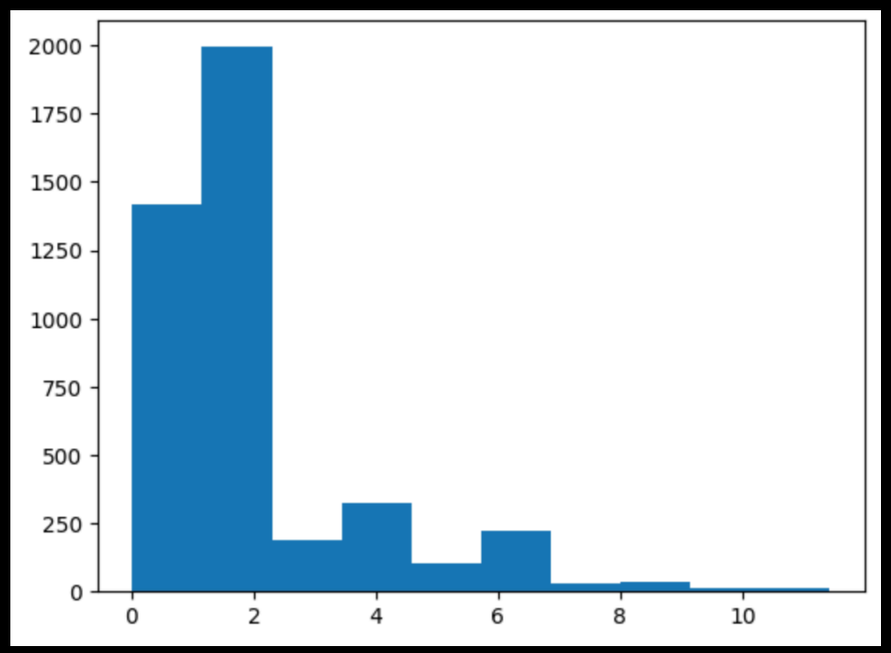
- Confirmed: All obs dates were correctly input in date format.
- **Checks required**:
  - Orbital branch: I, O, q, — are expected, *but* `{'-', 'I', 'I ', 'O', 'Q', nan, 'q'}`
    - ‘I ‘: 21P, C/2003 WT42
    - ‘Q’: 54P, 67P
    - NaN: 288P

db_dust_activity_level

Data Sanity Check

- **Checks required**:
  - Band names are inconsistent: `'B Bessell', 'B-Bessell',` <— same for R & V
  - Extra space : `'R', 'R ',`
  - What's the difference between *R* and *R-band*?

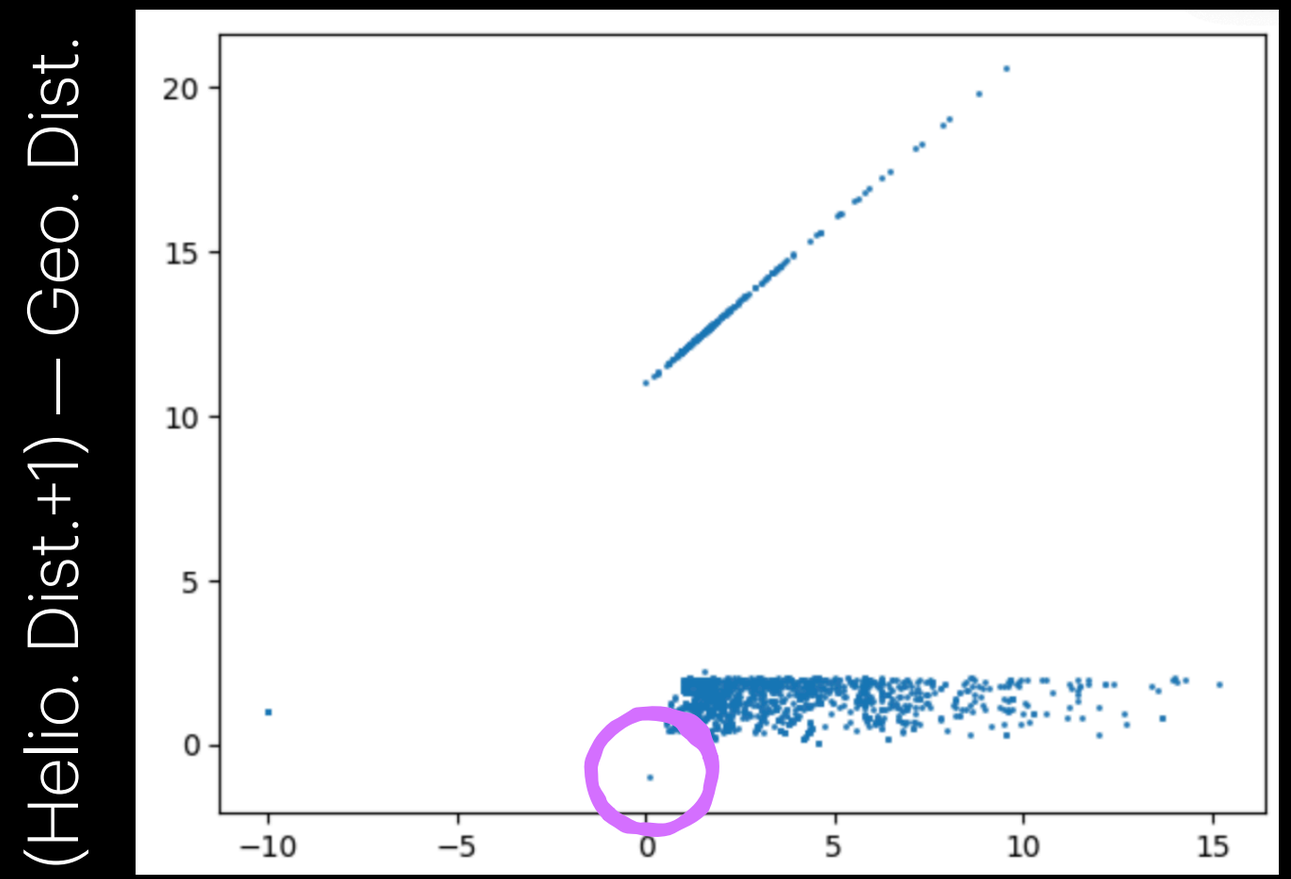
- Confirmed: perihelion distance looks fine.



db_dust_activity_level

Data Sanity Check

- **Checks required**:
  - Incorrect input of observing geometry info:



db_dust_activity_level

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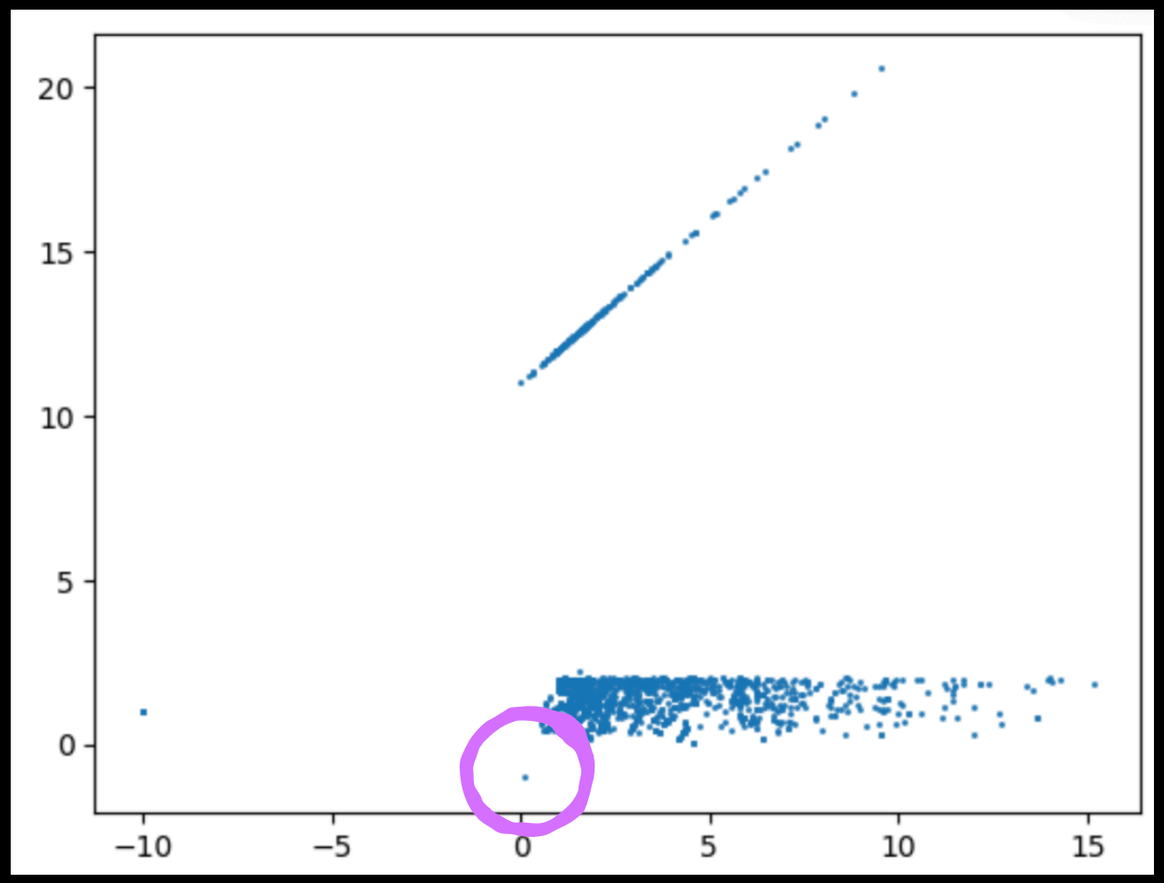

- Array index: 2852nd
  - 78P/Gehrels 2
  - r_H = 0.076 au
  - Delta = 2.1 au
  - Phase = 3.3 deg

Date	Δ (au)[a]	r_h (au)[b]
2020/1/22	2.044	2.979
2020/1/23	2.044	2.984
2020/1/30	2.05	3.016
2020/2/1	2.054	3.025
2020/2/3	2.06	3.034
2020/2/5	2.067	[illegible]
2020/2/12	2.1	3.076

db_dust_activity_level

Data Sanity Check

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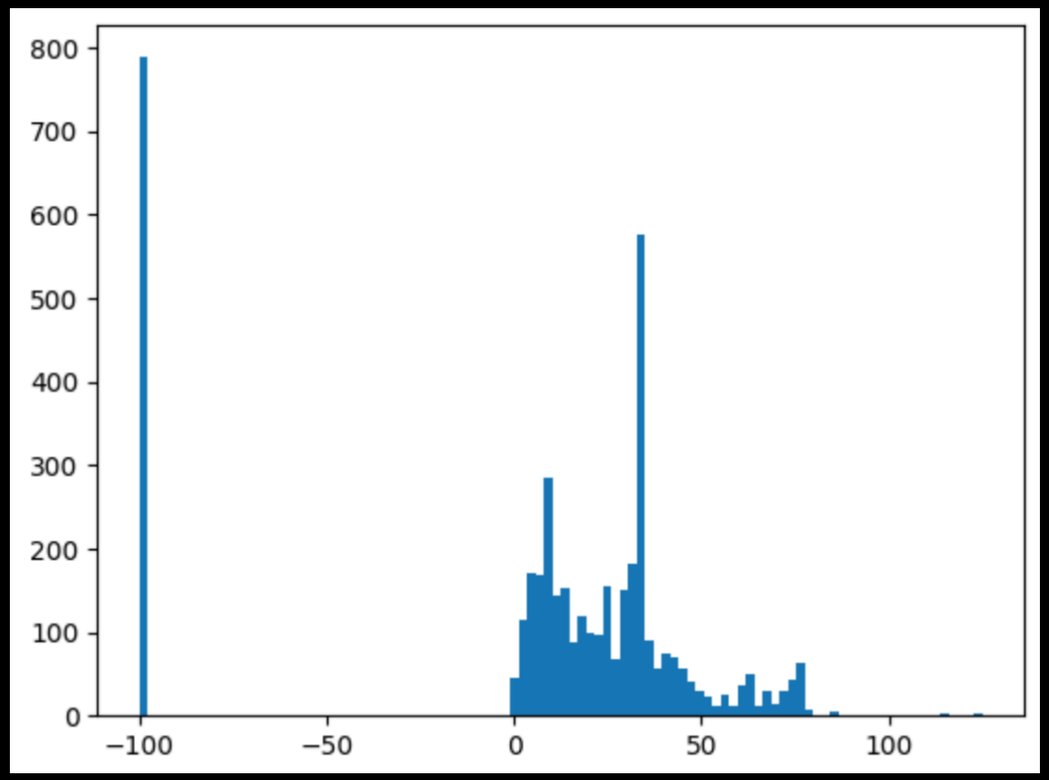
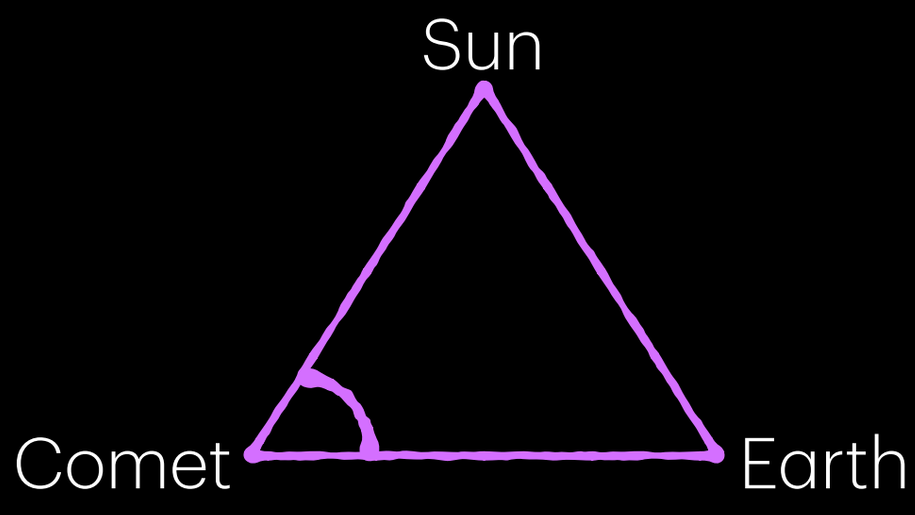


Phase angle



db_dust_activity_level

Data Sanity Check

- **Checks required**:
  - Incorrect input of observing geometry info:
- Array index: 1183rd
  - 45P/H-M-P
  - r_H = 1.56 au
  - Delta = 0.36 au

But, Horizon's delta on the date was ~0.63 au, which means the delta in the original paper is transposed.

UT Date	r_h (au)	Δ (au)
2017 Feb 10.25	0.97	0.08
2017 Feb 13.12	1.01	0.09
2017 Feb 13.16	1.01	0.09
2017 Feb 13.20	1.01	0.09
2017 Feb 16.20	1.05	0.11
2017 Feb 19.16	1.09	0.13
2017 Feb 19.20	1.09	0.13
2017 Feb 19.25	1.09	0.13
2017 Feb 25.20	1.18	0.20
2017 Feb 25.25†	1.18	0.20
2017 Feb 25.84	1.19	0.21
2017 Feb 25.92	1.19	0.21
2017 Feb 25.96	1.19	0.21
2017 Feb 26.12	1.19	0.22
2017 Feb 26.16	1.19	0.22
2017 Feb 26.25	1.19	0.22
2017 Mar 02.16	1.25	0.27
2017 Mar 02.20	1.25	0.27
2017 Mar 03.16	1.26	0.28
2017 Mar 04.20	1.28	0.30
2017 Mar 08.16	1.33	0.35
2017 Mar 08.16†	1.33	0.35
2017 Mar 08.25†	1.33	0.36
2017 Mar 20.16†	1.49	0.54
2017 Mar 21.16†	1.50	0.56
2017 Mar 25.94	1.56	0.36

db_dust_activity_level

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2017 Mar 04.20	1.28	0.30
2017 Mar 08.16	1.33	0.35
2017 Mar 08.16†	1.33	0.35
2017 Mar 08.25†	1.33	0.36
2017 Mar 20.16†	1.49	0.54
2017 Mar 21.16†	1.50	0.56
2017 Mar 25.94	1.56	0.36

But, Horizon's delta on the date was ~0.63 au, which means the delta in the original paper is transposed.

- Array index: 1206th
  - 46P/Wirtanen
  - r_H = 2.91 au
  - Delta = 3.57 au
  - Phase = 41.5 deg

09 Dec. 2001
00:15–00:52 UT
UT4+FORS2
2.91 AU
3.57 AU
41.5 deg

But, Horizon's phase on the date was ~12.9 deg, which means the delta in the original paper is transposed.

db_dust_activity_level

Data Sanity Check

- Confirmed:
  - Pixel scales
  - Afrhos & their errors
  - Aperture sizes & their projected sizes