TRAPPIST bright comets production rates: 103P/Hartley, 2P/Encke, C/2023 E1 (ATLAS), C/2020 V2 (ZTF), C/2022 A2 (PANSTARRS), and C/2017 K2 (PANSTARRS)

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The authors report that they obtained from TRAPPIST-South and TRAPPIST-North robotic telescopes (Jehin et al. 2011) recent observations under clear skies using cometary HB narrowband filters (Farnham et al. 2000) for the following comets and computed preliminary production rates at 10.000 km using a Haser Model (Vp=Vd=1km/s) (Haser 1957). The dust production rates proxy A(0)f(rho) were estimated by profile fitting at 10.000 km (A'Hearn et al. 1984) and corrected for the phase angle (Schleicher 2007).

The production rates of short period comets 103P/Hartley and 2P/Encke have risen fast while getting closer to perihelion.

103P/Hartley
Date UT=2023-10-08, r_h=1.06 au, Delta=0.4 au, DT=-3 days
Q(OH) = 3.20 +/- 0.70 E27 s-1
Q(NH) = 2.81 +/- 0.34 E25 s-1
Q(CN) = 8.96 +/- 0.49 E24 s-1
Q(C3) = 1.77 +/- 0.28 E24 s-1
Q(C2) = 1.13 +/- 0.06 E25 s-1
A(0)fp(RC) = 66 +/- 3 cm
A(0)fp(BC) = 35 +/- 6 cm

2P/Encke
Date UT=2023-10-04, r_h=0.56 au, Delta=0.96 au, DT=-17 days
Q(OH) = 2.44 +/- 0.47 E27 s-1
Q(NH) = 1.49 +/- 0.17 E25 s-1
Q(CN) = 2.46 +/- 0.12 E25 s-1
Q(C2) = 2.39 +/- 0.02 E25 s-1
A(0)fp(RC) = 64 +/- 2 cm
A(0)fp(BC) = 43 +/- 7 cm

C/2023 E1 (ATLAS)
Date UT=2023-10-07, r_h=1.84 au, Delta=0.98 au, DT=+98 days
Q(CN) = 4.46 +/- 0.40 E24 s-1

Q(C2) = 4.24 +/- 0.63 E24 s-1
A(0)fp(RC) = 27 +/- 2 cm
A(0)fp(BC) = 16 +/- 4 cm

C/2020 V2 (ZTF)
Date UT=2023-10-07, r_h=2.81 au, Delta=1.98 au, DT=+152 days
Q(CN) = 5.83 +/- 0.48 E25 s-1
Q(C2) = 4.04 +/- 0.69 E25 s-1
A(0)fp(RC) = 6552 +/- 18 cm
A(0)fp(BC) = 5901 +/- 68 cm

C/2022 A2 (PANSTARRS)
Date UT=2023-10-07, r_h=3.3 au, Delta=2.4 au, DT=+231 days
Q(CN) = 8.38 +/- 3.35 E24 s-1
Q(C2) = 8.69 +/- 3.56 E24 s-1
A(0)fp(RC) = 657 +/- 10 cm
A(0)fp(BC) = 622 +/- 11 cm

C/2017 K2 (PANSTARRS)
Date UT=2023-10-04, r_h=3.82 au, Delta=3.74 au, DT=+289 days
Q(CN) = 1.19 +/- 0.85 E25 s-1
Q(C2) < 3.75 E25 s-1
A(0)fp(RC) = 6158 +/- 96 cm
A(0)fp(BC) = 6169 +/- 150 cm

Notations: rh= heliocentric distance (in au), Delta=geocentric distance (in au), DT= Time to perihelion. OH, NH, C3, CN, C2 are the HB gaseous narrowband filters for the corresponding species, and BC, GC, RC are the blue, green and red dust continuum filters (Farnham et al. 2000).

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