## TRAPPIST C/2021 A1 (Leonard) comet production rates

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E. Jehin, Y. Moulane, and J. Manfroid, report that they obtained on 19 December, from 00:15 to 01:15 UT, with the TRAPPIST-South (code=I40) robotic telescope (Jehin el al. 2011) located at the ESO La Silla Observatory (Chile), three sets of cometary HB narrowband filters (Farnham et al. 2000) and broad band filters (B,V,Rc,Ic) on comet C/2021 A1 (Leonard) at high airmass under photometric conditions. The comet, 15 days from perihelion, was at a heliceontric distance of 0.70 au and 0.36 au from the Earth. Preliminary production rates at 10.000 km using a Haser Model (Vp=Vd=1km/s) (Haser 1957) were computed as well as the dust production rate proxy A(0)f(rho) estimated by profile fitting at 10.000 km (A'Hearn et al. 1984) and corrected for the phase angle (Schleicher 2007). The three sets of measurements were in very good agreement and the average value for each quantity is given below.

C/2021 A1 (Leonard) Date UT=2021-12-19, r\_h=0.70 au, Delta=0.36 au, DT=-15 days Q(OH)=(9.31+/-0.33) E28 s-1 Q(NH)=(5.90+/-0.20) E26 s-1 Q(CN)=(2.21+/-0.10) E26 s-1 Q(C2)=(2.61+/-0.08) E26 s-1 Q(C3)=(2.60+/-0.05) E25 s-1

A(0)fp(RC)= 975+/-52 cm A(0)fp(R)= 1087+/-30 cm

From these measurements, C/2021 A1 has the composition of a typical comet with log[Q(C2)/Q(CN)]=0.07 and it has a typical dust/gas ratio with log[Afp/Q(OH)]=-25.98 (A'Hearn et al. 1995).

Broad band images reveal a sharp and bright false nucleus of fwhm 5.5", R mag = 8.10+/-0.05, no peculiar coma features, and no fragment.

Notations: r\_h= 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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