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The activity of comet C/2007 D1 (LINEAR) at 9.7 AU from the Sun⋆ *(Corrigendum)*

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1. Introduction

We report the discovery of an incoherence while describing the results of modelling the dust mass-loss rate of comet C/2007 D1 (LINEAR). The code of the tool is correct, but while saying in Sect. 3 that we adopt the classical "cometary" values of geometrical albedo $A = 0.04$ and phase coefficient $\beta = 0.045$ mag/°, we erroneously use different values of both parameters (derived from different assumptions and formalisms: $A = \beta = 0.1$ as in Jewitt 2009) in the calculation. This propagates in the actual values of dust cross-section, dust mass in the coma annulus, and dust mass-loss rate. The table reported in this Corrigendum replaces Table 2 published in the original paper. Below we report how the final part of last paragraph of Sect. 3 (observational results) and central paragraph of Sect. 4 (discussion and conclusions) should be read. Our conclusions on the intense post-perihelion activity of comet C/2007 D1 are even strengthened by these new calculations.

2. Observational results

Adopting then a more realistic dust grain velocity $v(r) \sim 50\ \mathrm{m\,s^{-1}}$, a value of $\frac{\mathrm{d}M_\mathrm{d}}{\mathrm{d}t} = 9.9 \times 10^2\ \mathrm{kg\,s^{-1}}$ is obtained from the photometric model. Table 1 summarises the values derived for all the quantities defined above, for both the realistic value and the upper limit (gas ouflow) of the dust grain velocity.

3. Discussion and conclusions

The first-order photometric model (Jewitt 2009) for determining of the dust-loss rate that we applied to the images, by using a realistic value for the dust grain velocity (see above), inferred a very high value of $\frac{\mathrm{d}M_\mathrm{d}}{\mathrm{d}t} = 9.9 \times 10^2\ \mathrm{kg\,s^{-1}}$. This value is indicative of a very active comet, similar to (if not more active than) the "paradigm" comet C/1995 O1 (Hale-Bopp), for which a $\frac{\mathrm{d}M_\mathrm{d}}{\mathrm{d}t} \sim 500\ \mathrm{kg\,s^{-1}}$ was obtained by modelling at $r = 13$ AU (Fulle et al. 1998). For comparison, by applying the first-order photometric model to the active Centaur 29P/S-W1 at $r = 5.8$ AU, Jewitt (2009) obtained a dust production rate of $\frac{\mathrm{d}M_\mathrm{d}}{\mathrm{d}t} = 5.1 \times 10^3\ \mathrm{kg\,s^{-1}}$, while the application of the inverse tail model by Fulle (1992), which reconstructed the dynamical dust environment (ejection velocity, dust-loss rate, and reliable dust-grain size distribution) of the Centaur, resulted in a constant value of the dust production rate of $6 \times 10^2\ \mathrm{kg\,s^{-1}}$ during the three years spent by the Centaur at about the same heliocentric distance. To a first-order approximation, if we apply the same scaling factor to the upper limit to the dust-loss rate ($\frac{\mathrm{d}M_\mathrm{d}}{\mathrm{d}t} = 9.26 \times 10^3$, see Table 1), we would obtain a dust-loss rate of $\sim$1100 kg s^{-1} for comet C/2007 D1, which is very similar to the value obtained using the photometric model with realistic velocity value.

Table 1. Model dust mass-loss rate of comet C/2007 D1 (LINEAR).

m_d [a]	C_d [m^2] [b]	M_d [kg] [c]	$v(r)$ [m s^{-1}] [d]	τ [s] [e]	$\frac{\mathrm{d}M_\mathrm{d}}{\mathrm{d}t}$ [kg s^{-1}] [f]
18.71	8.79×10^9	3.71×10^8	50†	3.74×10^5	9.93×10^2
			466§	4.00×10^4	9.26×10^3

Notes. [(a)] Coma magnitude in the projected annulus between $\phi = 0.5''$ and $\phi' = 3.3''$. [(b)] Derived dust cross-section. [(c)] Derived dust mass in the coma annulus. [(d)] Dust grains radial outflow speed in the coma annulus; † realistic case, § upper limit case (gas outflow velocity). [(e)] Crossing time of the (projected) coma annulus. [(f)] Derived dust mass-loss rate.

⋆ Based on observations collected at the Italian Telescopio Nazionale Galileo (TNG), operated on the island of La Palma by the Centro Galileo Galilei of the INAF (Istituto Nazionale di Astrofisica) at the Spanish Observatorio del Roque de los Muchachos of the Instituto de Astrofísica de Canarias.

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