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Erratum: Comet 67P outbursts and quiescent coma at 1.3 AU from the Sun: dust properties from Rosetta/VIRTIS-H observations

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Key words: errata, addenda – comets: general – comets: individual: 67P/Churyumov-Gerasimenko – infrared: planetary systems.

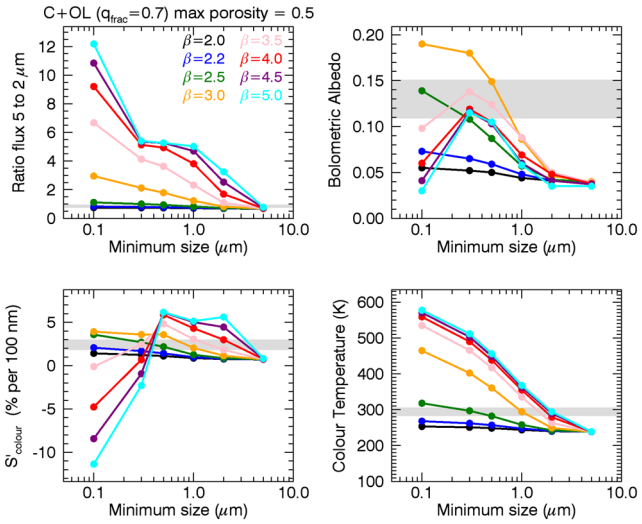

Figure 1. Replaces Fig. 8 of Bockelée-Morvan et al. (2017). Results of Mie-scattering calculations for moderately porous (P_{max} = 0.5) carbon/olivine mixtures. The grey area (not included in the original figure) shows the range of observed values on 13 and 14 September 2015 (pre-outburst).

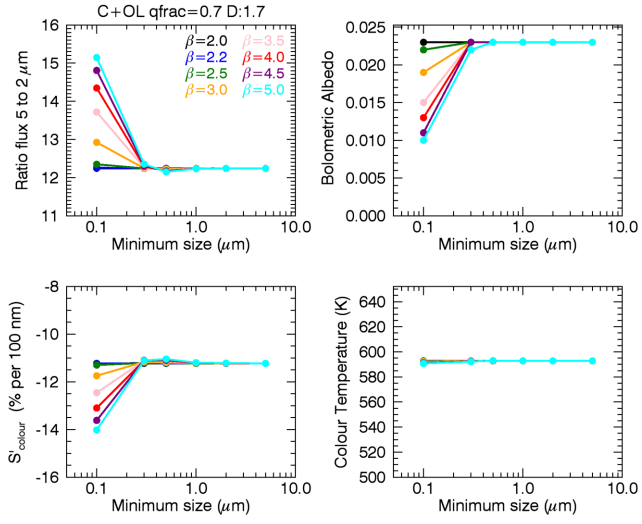

Figure 2. Replaces Fig. 9 of Bockelée-Morvan et al. (2017). Results of Rayleigh-Gan-Debye calculations for fractal aggregates made of carbon/olivine mixtures.

The paper 'Comet 67P outbursts and quiescent coma at 1.3 AU from the Sun: dust properties from Rosetta/VIRTIS-H observations' was published in MNRAS 469, S443 (2017). While performing a follow-up investigation, we discovered a numerical error in the algorithms that were developed to model the infrared continuum emission from a population of dust particles. The results of the scattering models for compact or moderately porous grains (Mie theory) and fluffy grains (Rayleigh-Gans-Debye theory, RGD) are both affected. Though the general conclusions of the paper are unchanged, the quantitative constraints obtained on the dust size distribution in the quiescent coma are slightly different.

Figs 8, 9, 10 and 11 should be replaced by, respectively, Figs 1, 2, 3 and 4 of this erratum. The new resuts introduce the following changes :

(i) Section 4.2, second paragraph (quiescent coma, Mie results): for moderately porous grains (P_{max} = 0.5), the sets of size distribution parameters which fit satisfactorily the measurements are now (a_{min}, β) = (0.3 μm, 2.5) and (0.9 μm, 3.0) (see Fig. 1). For non-porous grains, the updated parameters fitting the colour temperature and colour (whereas overestimating the bolometric albedo) are (a_{min}, β) = (0.1 μm, 2.5) and (0.5 μm, 3.0).

(ii) Section 4.2, last paragraph (quiescent coma, RGD results): we find now that, for a relative number of fluffy aggregates of

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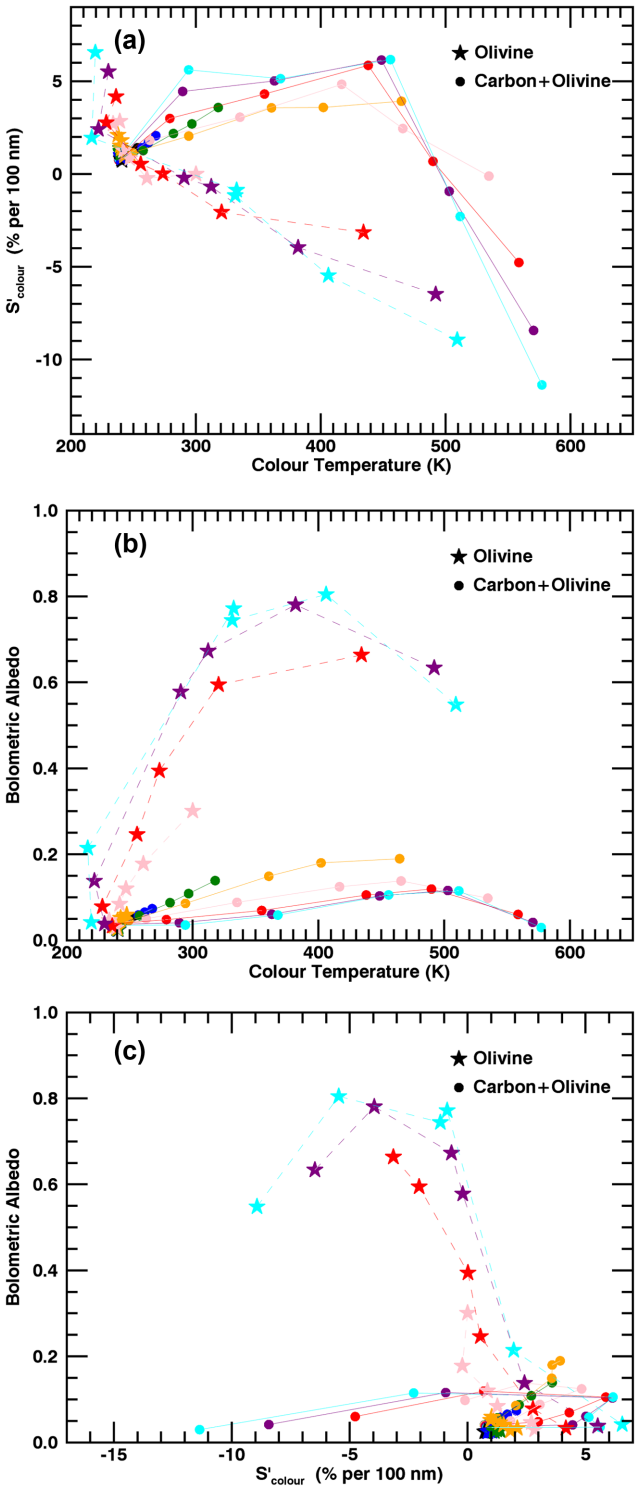

Figure 3. Replaces Fig. 10 of Bockelée-Morvan et al. (2017). Results from Mie-scattering calculations: correlation between spectral properties.

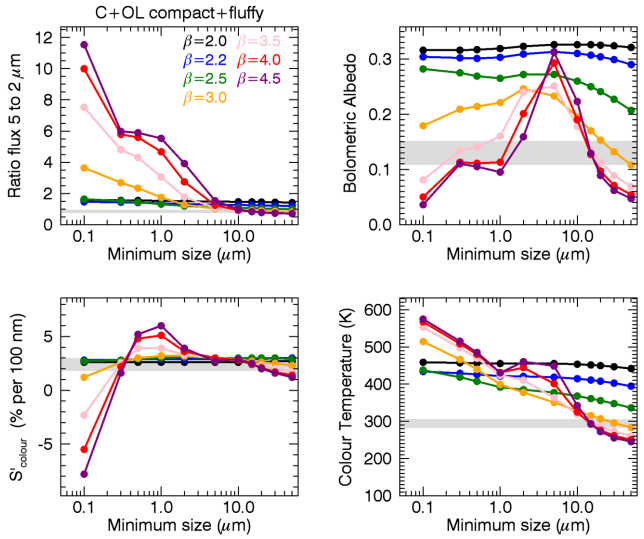

Figure 4. Replaces Fig. 11 of Bockelée-Morvan et al. (2017). Results for relative fractions of 25 per cent of fractal aggregates and 75 per cent of moderately porous carbon/olivine mixtures ($P_{max} = 0.5$). The grey area (not included in the original figure) shows the range of observed values on 13 and 14 September 2015 (pre-outburst).

25 per cent, the VIRTIS-H data can be explained providing the minimum radius of the particles exceeds 10 μm (Fig. 4). Good matches of colour, colour temperature and bolometric albedo are obtained for $(a_{min}, \beta) = (30\ \mu m, 3.0)$ and $(20\ \mu m, 3.5)$. Size indexes smaller than 2.5 are excluded (Fig. 4).

(iii) Section 6 (Summary and conclusions), fourth paragraph (Size distribution in quiescent coma): the parameters (a_{min}, β) fitting the data assuming moderately porous grains should be updated following the corrections provided above. It was previously derived that, when considering mixtures of compact particles and fractal aggregates, a size index in the range 2–2.5 is favoured. We now find that the size index should be ≥ 3, which is consistent with the constraint obtained by Fulle et al. (2016) from GIADA data.

REFERENCES

Bockelée-Morvan D. et al., 2017, MNRAS, 469, S443
Fulle M. et al., 2016, ApJ, 821, 19

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