

# ***Interactive comment on “Morphology and Raman spectra of aerodynamically-classified soot samples” by Alberto Baldelli and Steven Nicholas Rogak***

## **Anonymous Referee #2**

Received and published: 17 June 2019

This is an interesting and well-written paper focusing on the relationship between Raman spectroscopy and morphology and structure of soot particles. The authors use TEM and ELPI+ in order to gather the particle morphology. Raman spectroscopy has been used to determine structural information. The subject of the manuscript fits well into AMT, but conclusions are rather short and somewhat weak. I recommend publication after major revisions of the conclusion section.

## Specific Comments

Abstract, p1, L15: “5 absorption bands” this is simply wrong. Raman is an inelastic scattering technique and is not related to any absorption phenomena. Just say “5

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vibrational bands”

P1, L29: “crystalline fullerenic carbon” is not the right wording. Soot either includes crystalline graphite-like carbon, amorphous carbon and very rarely fullerenes. Incomplete fullerene structures (fullerenic carbon?) are caused by defects and are non-planar (incomplete sp<sup>2</sup> hybridized) and therefore are amorphous.

P2, L7: “A correlation between particle size....” You might quote here a recently accepted AMTD paper: Haller, T., Rentenberger, C., Meyer, J. C., Felgitsch, L., Grothe, H., and Hitzengerger, R.: Structural changes of CAST soot during a thermal-optical measurement protocol, *Atmos. Meas. Tech. Discuss.*, <https://doi.org/10.5194/amt-2019-10>, in review, 2019.

P2, L12: “Laboratory burners....” You might discuss similarities and differences regarding the CAST burner, which is the most commonly used burner for laboratory soot studies. P5, L18: “Raman spectroscopy is sensitive not only to...” better write “Raman spectroscopy is sensitive only to short-range order, molecular structures but due to the symmetry of the observed vibrations also structures and morphologies can be differentiated (Sadezky et al. 2005).

P6, L5: “The titanium substrate was selected...” better write “...since titanium and TiO<sub>2</sub> exhibit no Raman active vibrations in the area of interest...”

P6, L14: Explain how you subtracted the fluorescence of the soot.

### General Comments

Don't use the word “peak ratios” when describing “band ratios”. Other phrases are: intensity ratios, ratios of band areas, etc.

Transfer “lpm” into “sccm”

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Interactive comment on *Atmos. Meas. Tech. Discuss.*, doi:10.5194/amt-2019-86, 2019.

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