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Interactive comment on "Real-time pollen monitoring using digital holography" *by* Eric Sauvageat et al.

Anonymous Referee #1

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The work presented in this article, is very interesting and the use of "digital holography" is a great novelty, but I will make some considerations, since it is a scientific work and not only the description of a new real-time sampling system: Introduction lines. 40-41 "To respond to the need for real-time pollen information, numerous partly- or fully-automated monitoring systems have been developed and investigated over the past decade, with some recently having reached an operational level" The authors should extend the introduction, describing succinctly the monitoring systems have been developed in the past decade and what physical principles or algorithms have been based on, only mention some, with the comment that it is the only thing that has been done in Europe. Other bioaerosol sampling has been carried out with different automated methods (e.g. Kawashima et al. 2016, Savage et al. 2017) and specifically in Europe

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Discussion paper

with the Wibs system (e.g. O'Connor et al. 2015, Calvo et al. 2018).

Results and discussion

3.2. Pollen classification

Lines 184. . ... "Note that in this regard the problem presented to the algorithm is somewhat artificial: Corylus and grass pollen are not likely to be simultaneously present in the atmosphere in concentrations relevant for pollen allergies". This assertion is not entirely true, there are European regions where hazelnut and grass blooms coincide. On the other hand, in this work the Betula pollen type is not mentioned, with morphological characteristics and of dimensions practically equal to Corylus and that if it is present in the atmosphere at the same time as grasses, in very high concentrations and sufficient to cause allergic responses. It is not likely that Swispoleno can differentiate these types through digital holography. But it would be very important to point out this fact, since Betula is the pollen type that causes the most allergy in Central Europe, along with the grasses

3.3 Reference particle counts and fluorescence observations

Line 205-208. "At present, this remains a difficult task since no method, standardised or other, exists to aerosolise a known quantity of a known pollen taxa". "Pollen grains are both considerably larger than other, non-biological aerosol particles and relatively fragile, so producing homogenised airborne concentrations is currently not possible with conventional techniques" In relation to these two paragraphs and others of the same section 3.3, the authors should review in greater depth certain bibliography related to the methods of differentiation of biological particles and quantification (among other pollen and spores) by fluorescence (e.g. Toprak and Schnaiter 2013, Hernández et al. 2016, Savage et al. 2017)

4 Towards operational pollen monitoring

"The focus of this study was to assess the performance of the Swisens Poleno, the first

operational automatic pollen monitoring system based on digital holography". Certainly digital holography is the first time it has been used in bioparticle monitoring systems (specifically pollen) in real time, but the authors need to make a deep and detailed discussion, highlighting the advantages, similarities or great differences with other types of bioaerosol monitoring systems in real time. As I point out with some bibliographical references, certain pioneering works in this field are not mentioned

Finally, making few modifications to the introduction and discussion, the article can be published without problems, because I consider that the work constitutes a good scientific contribution, and a good basis to continue working in this field, as the authors propose

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