

Referee #2,

We thank you for your thoughtful comments and thorough reading of the paper. We have made the suggested changes and added data and references where requested. A point by point response follows.

Major comments:

1. The characterization performance results are convincing, however, and this is optional if authors could also present some research application results.

Since submission of this “proof of concept” of the printed fluidized bed generator we have now put it into operational use to generate mineral dust particles in our lab. Specifically, we are studying the effects of mineral dust particles on the output of different solar cells.

Towards this point we have added the following text and a figure (Fig. 8) of the generated particle number size distribution:

(Page 1, line 14):

“Additional tests with collected soil dust samples are also presented.”

(Page 4, line 16-19):

“In addition, PRIZE was used to disperse an arid soil sample collected in Saudi Arabia. Data for each experiment and the soil dust dispersion are presented in the subsequent sections.”

(Page 5, line 26-29):

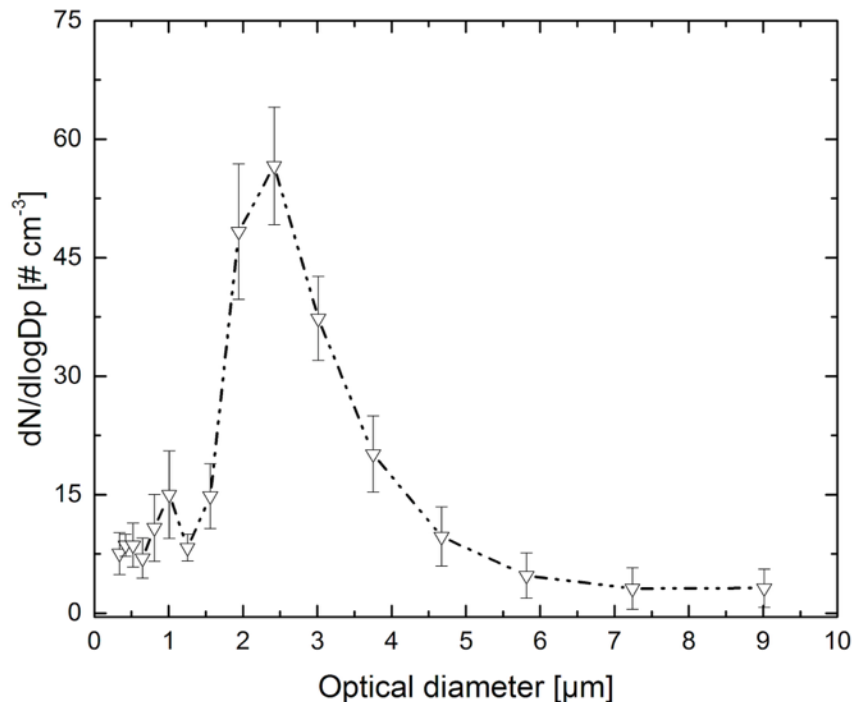
“A final experiment was conducted to demonstrate the use of PRIZE for dispersion of collected soil dust samples. Fig. 8 provides a size distribution of particles dispersed from an arid soil sample collected in Dhahrat Laban (west of Riyadh, Saudi Arabia).”

(Page 6, line 5):

“We demonstrate the use of PRIZE for collected samples of soil dust and note its use with mass spectrometry or transmission electron microscopy. ”

(Page 16, line 1):

Figure 8:



2. It is not clear ‘what are the limitations of the existing aerosol generators.’

The presented particle generator is a low-cost addition to already existing dry particle generation instruments. To expand on this we added the following statement to the manuscript.

(Page 5, line 31):

“This study describes the design, manufacture and proof-of-concept experiments of the 3D printed fluidized bed generator PRIZE, which is a compact, simple and low-cost addition to existing dry particle generation instruments.”

3. It is mentioned that (page 2 line13) the existing flask design requires multiple instruments and supervision of the setup. This is incorrect.

We agree. The statement on page 2, line 13 was deleted.

4. Further, they say FBAG and SSPD involves mechanical moving parts and larger weight. It is not clear how having multiple moving parts and weight (< 50lbs) impedes the research ability of the instrument to generate the dry powder.

We agree that the weight of an instrument has no influence on the ability to generate particles from dry powder. However, a lower weight of the instrument would further enable its use in e.g. remote field applications. To clarify this we added the following statement to the manuscript.

(Page 2, line 20):

“In comparison to existing dispersion devices, the PRIZE generator does not contain moving parts, features smaller dimensions and mass, and has a lower cost, requiring only access to 3D printing. This allows for multiple PRIZE generators to be used with different samples, thereby reducing the time and possible artifacts associated with cleaning procedures on a single generator.”