

# Atmospheric particle in-situ imaging and classifying with digital holography

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Digital holography is a contact-free imaging method that can work with a naturally flowing air stream. We have built a prototype model for a lightweight, low-cost digital holography instrument, titled HAPI, that can image coarse-mode aerosol particles, with sizes ranging from tens of micrometers up to millimeters, in the atmosphere. We have also developed the necessary algorithms to automatically reconstruct the particles' two-dimensional silhouettes and classify them into particle species. The instrument is flown on a drone for easy deployment and three-dimensional sampling.

The instrument concept will allow imaging large atmospheric particles almost anywhere in the lower boundary layer with minimal set-up required, and with very low operational costs. We expect the instrument will greatly add to the knowledge of coarse-mode aerosol particle morphology, and we hope to create an aerosol shape database that can be used to improve various atmospheric simulations and retrievals. In this presentation we show the first results of our measurements.

Preferred mode of presentation: Oral/Poster