

Dear editor,

Thank you for your comments and the decision about our manuscript "Laboratory and field evaluation of the Aerosol Dynamics Inc. concentrator (ADIC) for aerosol mass spectrometry". Regarding your comment on multiplex chopper:

"I would like you to provide a more comprehensive response to Reviewer 2's question: '(3) Please clarify what a "multiplex chopper" is.' You essentially responded, "it's a chopper that multiplexes." This doesn't really explain what multiplexing means in the context of a beam chopper. Please provide a concise but more descriptive explanation, with a reference if appropriate."

we have revised our response to Reviewer 2's comment (3). New response is:

**Response:** In the AMS, the transmission of the beam to the particle detector is modulated with a mechanical chopper that is operated at 100–150 Hz. Time-resolved detection of the particles, coupled with the known flight distance, gives the particle velocity from which the particle aerodynamic diameter is obtained. Typically, the chopper wheel has one or two radial slits giving a sampling duty cycle of 1–4%. The multiplex chopper has multiple slits in a specific sequence, such that particles of many sizes are arriving at the detector at any given time. This multiplexed signal is then deconvolved with a Hadamard transform to retrieve the particle size distribution. The advantage is that the particle throughput is close to 50% leading to better signal to noise. We call this the efficient Particle time of Flight (ePToF) chopper. Unfortunately, we don't have a reference for this yet.

**Changes in manuscript:** We added to the text: "were equipped with a multiple slit chopper (efficient Particle Time of Flight, ePToF, chopper) with 50% particle throughput"

We posted a new authors' comment regarding this revision.

On behalf of all authors,

Sanna Saarikoski