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Review

## Calculation of concentration of aerosol particles around a slot sampler

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**Abstract**

A mathematical model and numerical procedure are proposed for investigation of aspiration efficiency and the particle concentration field around a slot sampler in a moving gas. A potential-flow model for the carrier gas and a Lagrangian method for calculation of particle trajectories and concentration are employed. The particle concentration patterns around the slot and at the sampler inlet are studied. The dependence of the aspiration efficiency on the ratio of the wind and sampling velocities is analyzed. It is shown that the local aspiration efficiency calculated on the symmetry axis of the slot gives satisfactory approximation for the integral aspiration efficiency.

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*Keywords:* Aerosol sampling; Aspiration efficiency; Particle concentration

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**Contents**

1. Introduction . . . . .	4773
2. Formulation of the problem . . . . .	4774
3. Numerical results. . . . .	4776
4. Conclusions . . . . .	4779
Acknowledgment . . . . .	4779
References . . . . .	4780

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**1. Introduction**

Direct methods of aerosol measurements in atmosphere are based on aerosol sampling into different measuring devices. Aerosol probes give an

opportunity to determine the particle concentration and the particle size distribution. The presence of the sampler and the action of sampling cause disturbances in the surrounding medium and affect the particle movement. It can lead to significant difference of the given fraction particle concentration in the sampler inlet and in the free stream. In the sampling theory, the notion of aspiration efficiency is introduced to characterize the deviations

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