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Diffusion of particles: to what extent can experiments support numerical simulations and vice versa?

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ABSTRACT

In this work, the effect of particle mass loss due to the size of the detection window on particle diffusion is investigated with the use of a numerical model of saltating grains. In order to formulate the problem, the available experimental data of particle diffusion were presented and discussed briefly. Five different detection window sizes were investigated, showing that at least in the transverse direction the calculated spread of the particles noticeably decreases with the decrease in the window size and increase in the mass loss, suggesting the slowdown of the diffusion process over its duration. The obtained results suggest that the interpretation of real experimental data may be incorrect and lead to false conclusions about the regime of the diffusion of particles.