

Abstract Submitted
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An LES study of pollen dispersal from isolated populations: Effects of source size and boundary-layer scaling¹ MARCELO CHAMECKI², CHARLES MENEVEAU, Johns Hopkins University, MARC B. PARLANGE, Ecole Polytechnique Federale de Lausanne (EPFL) — A framework to simulate pollen dispersal in the atmospheric boundary layer based on the large eddy simulation technique is developed. Pollen is represented by a continuum concentration field and is evolved following an advection-diffusion equation including a gravitational settling term. The approach is validated against classical data on point-source releases and our own field data for a natural ragweed field. The LES is further used as a tool to investigate the effect of source size on the patterns of pollen ground deposition, an issue of fundamental importance in the development of policies for genetically modified crops. The cross-wind integrated deposition is shown to scale with the pollen boundary-layer height at the trailing edge of the field and a simple practical expression based on the development of the pollen boundary layer is proposed to scale results from small test fields to realistic agricultural conditions.

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