

Abstract Submitted
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Windblown dust emission, transport and deposition in solar farms CHUANJIN LAN, ZHEN LI, YANBAO MA, School of Engineering, University of California, Merced — Dust accumulation on solar collectors can significantly reduce the electrical output of solar farms. The presence of solar panel array can significantly accelerate or decelerate wind speed and distort the wind velocity profiles near the ground, which leads to considerable changes in dust emissions, transportation as well as deposition. To examine the effects of solar panels on dust emission, transportation and deposition, the incompressible viscous flow past flat solar panels with ground effect was numerically investigated based on finite volume method. A hybrid approach known as detached-eddy simulation (DES), combining the main features of both large-eddy simulation (LES) and Reynolds-averaged Navier-Stokes (RANS), is utilized to compute the turbulence flow. Results show how aerolian dust emissions, transport and deposition are affected by wind speeds, solar panel orientation angles and panel geometries.

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