Geophysical Research Abstracts
Vol. 20, EGU2018-5630, 2018
EGU General Assembly 2018

Wind patterns through utility scale solar facilities and implications for dust

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Dust deposition on solar energy collectors can significantly reduce production efficiency, especially in arid regions where dust is prevalent. Solar fields, both solar-thermal type and photovoltaic (PV) type are often built in sequential rows in order to maximize energy production and land use efficiency. These repeating features can result in alteration of the wind field near the soil surface and therefore the potential for wind erosion and emission of dust. This study reports on over two years of near-surface wind measurements within a large PV facility near Las Vegas, Nevada USA. Multiple measurements of wind speed and direction were collected between two consecutive rows of panels under varying ambient wind conditions. A preliminary but clear picture of the mean flow between rows provides insight into the potential for dust problems at such facilities.