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PV Paper Published in *IEEE Transactions on Sustainable Energy*

Sandians Mathew Lave and Joshua Stein (both in the Photovoltaics and Distributed Systems Dept.) along with Jan Kleissl (UC–San Diego) published "A Wavelet-Based Variability Model (WVM) for Solar PV Power Plants" in the April 2013 IEEE Transactions issue. (Matthew Lave was a Sandia student intern when this work was being done and will be a new staff member starting at the end of April. This work was part of his Ph.D. thesis.)

Their article presents a wavelet variability model (WVM) for simulating solar photovoltaic (PV) power plant output given a single irradiance point sensor time series using spatio-temporal correlations. Their work simulated the variability reduction (VR) that occurs in upscaling from the single point sensor to the entire PV plant at each timescale, then combined the results with the wavelet transform of the point sensor time series to produce a simulated power plant output.

The WVM is validated against measurements at a 2-MW residential rooftop distributed PV power plant in Ota City, Japan, and at a 48-MW utility-scale power plant in Copper Mountain, Nevada. The WVM simulation matches the actual power output well for all variability time scales, and the WVM compares well against other simulation methods.

Matthew Lave is a Ph.D. student at the University of California, San Diego (UCSD). Matt's research focuses on variability analysis of solar radiation and solar power. His Ph.D. thesis is exploring upscaling and downscaling solar radiation time series using wavelets.

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