



# 2022 PV Performance Modeling Workshop

**Date:** August 23-24, 2022

**Site:** Salt Lake City, Utah USA

**Day 1** **Tuesday, August 23, 2022**

7:00	1:00	Breakfast and Registration		
8:00	0:05	Welcome from GroundWork Renewables	Ann Gaglioti	GroundWork Renewables
8:05	0:05	Welcome from Sandia National Laboratories	Joshua Stein	Sandia National Laboratories
8:10	0:30	Keynote Talk: 2021 PVPMC Modeling Comparison	Marios Theristis	Sandia National Laboratories
<b>Session 1</b>		<b>Solar Resource Assessment</b>	<b>Chair: Justin Robinson</b>	GroundWork Renewables
8:40	0:20	The Importance of Data Quality for Reducing the Uncertainty of Site-Adapted Solar Resource Datasets	Patrick Keelin	Clean Power Research
9:00	0:20	The National Solar Radiation Database (NSRDB): Recent Updates, New Developments and Status in 2022	Manajit Sengupta	NREL
9:20	0:20	Solar Ground Measurements Processing by Automatic and Manual Tools	Jozef Dudzak	Solargis
9:40	0:20	Worldwide Benchmark of Modeled Solar Surface Irradiance	Adam Jensen	Technical University of Denmark
10:00	0:15	Discussion		
<b>10:15</b>	<b>0:30</b>	<b>Networking Break</b>		
<b>Session 2</b>		<b>Sub-Model Development</b>	<b>Chair: Marios Theristis</b>	Sandia National Laboratories
10:45	0:20	The "Fresnel Equations" for Diffuse Radiation on Inclined Photovoltaic Surfaces (FEDIS)	Yu Xie	National Renewable Energy Laboratory
11:05	0:20	Improved Heat Transfer Correlation for Large-Scale Solar Photovoltaic Convection Modeling	Sarah Smith	Portland State University
11:25	0:20	The Influence of System-Level Design Elements on Convective Cooling in Solar Farms	Brooke Stanislawski	University of Utah
11:45	0:20	Modeling Electrical Shading Effects in PVsyst	Michele Oliosi	PVsyst
12:05	0:15	Discussion		
<b>12:20</b>	<b>1:00</b>	<b>Lunch</b>		
<b>Session 3</b>		<b>Posters</b>		
<b>13:20</b>	<b>1:00</b>	<b>Poster Session</b>		
<b>Session 4</b>		<b>Modeling Tools and Software Updates</b>	<b>Chair: Kirsten Perry</b>	National Renewable Energy Laboratory
14:20	0:20	PV Performance Modeling with Pvsit	Mark Campanelli	Intelligent Measurement Systems LLC
14:40	0:20	pvlb-python Update	Kevin Anderson	National Renewable Energy Laboratory
15:00	0:20	Solecito: A Software Library for the Detailed Simulation of Photovoltaic Arrays	Martín Herreras Azcué	University of Stuttgart
15:20	0:15	Discussion		
<b>15:35</b>	<b>0:30</b>	<b>Networking Break</b>		
<b>Session 5</b>		<b>Modeling Tools and Software Updates</b>	<b>Chair: Ann Gaglioti</b>	GroundWork Renewables
16:05	0:20	Automating the Preliminary Solar Resource and Production Assessment	Annalise Miller	Avangrid
16:25	0:20	Updates and Improvements in the Latest PVsyst versions	Bruno Wittmer	PVsyst
16:45	0:20	Update on SAM	Janine Keith	National Renewable Energy Laboratory
17:05	0:20	Daly: Solar + Storage Modeling Software	Josh Wirth	Daly Energy
17:25	0:15	Discussion		
<b>17:40</b>	<b>0:50</b>	<b>Break</b>		
<b>18:30</b>	<b>2:00</b>	<b>Welcome Dinner and Reception Hosted by GroundWork Renewables (open to all participants)</b>		



<b>Day 2</b>		<b>Wednesday August 24, 2022</b>		
7:00	1:00	Breakfast		
<b>Session 6</b>		<b>PV Tracking</b>	<b>Chair: Jim Crimmins</b>	CFV Labs
8:00	0:20	Sky-Image-Based Tracking Algorithm	Ben Pierce	Sandia National Laboratories
8:20	0:20	Performance Modeling and Analysis of Terrain-Following Single-Axis Tracking PV Systems	Amir Asgharzadeh Shishavan	Nextracker
8:40	0:20	Bifacial Benefits in Snowy Conditions: Single Axis Tracking Field Observations in Modeling	Sara MacAlpine	juwi
9:00	0:20	Validation of Industry Snow Models	Halley Darling	UL
9:20	0:20	Evaluating Energy Gains on Intelligent Tracker Control Algorithms with Alternating A-B Tests	John Moseley / Kyumin Lee	Array Technologies
9:40	0:15	Discussion		
<b>9:55</b>	<b>0:40</b>	<b>Networking Break</b>		
<b>Session 7</b>		<b>PV Data Analysis and Analytics</b>	<b>Chair: Janine Keith</b>	National Renewable Energy Laboratory
10:35	0:20	Orange Button: Accelerating PV Capabilities by Facilitating Data Exchange	Cliff Hansen	Sandia National Laboratories
10:55	0:20	PVAnalytics: A Python Package for Automated QA/QC of Solar Time Series Data	Kirsten Perry	National Renewable Energy Laboratory
11:15	0:20	Advanced System Monitoring and Artificial Intelligent Data-Driven Analytics to Serve GW Scale Photovoltaic Power Plant and Energy Storage Requirements	Juergen Sutterlueti	Gantner Instruments
11:35	0:20	Large-Scale PV Plant Performance Benchmarking - Methods and Initial Results	Wayne Li	Electric Power Research Institute
11:55	0:20	Soiling Measurement Data Processing to Support Production Loss Prediction	Julie Chard	GroundWork Renewables
12:15	0:15	Discussion		
<b>12:30</b>	<b>1:00</b>	<b>Lunch Break</b>		
<b>Session 8</b>		<b>Bifacial</b>	<b>Chair: Cliff Hansen</b>	Sandia National Laboratories
13:30	0:20	Irradiance Uniformity Mapping Module and Applications	Daniel Zirzow	CFV Labs
13:50	0:20	Validation of In-Situ I-V Measurement for PV Systems	Audrey Marquis	Atonometrics
14:10	0:20	Improved Tracking Schemes for Half-Cut Photovoltaic Modules	Aron Dobos	Nextracker
14:30	0:20	Comparison of Ray Tracing Rendering Technique with Ground Measurements for Improved Solar Radiation Modeling	Tomas Cebacauer	Solargis
14:50	0:15	Discussion		
15:05	0:10	Closing Remarks for Main Session	Joshua Stein	Sandia National Laboratories
<b>15:15</b>	<b>0:30</b>	<b>Networking Break</b>		
<b>Session 9</b>		<b>pvlb users group &amp; tutorial</b>	<b>Adam Rasmus Jensen and Cliff Hansen</b>	Technical University of Denmark & Sandia National Laboratories
15:05	0:55	pvlb user group meeting		
16:00	2:00	pvlb tutorial and training session	<b>Silvana Ayala</b>	National Renewable Energy Laboratory
18:00		End of Workshop		



## Poster Session

Number	Title	Name	Institution
1	Subinterval Distribution Rather than Steady-State Assumption in Time-Series Simulation of Solar Photovoltaic Systems	Andy Walker	National Renewable Energy Laboratory
2	DNV Hourly Modeling Correction	Madison Ghiz	DNV
3	Classification Method to Predict the Effect of Short-Term Inverter Saturation on PV Performance Modeling	Jonathan Allen	Allen Analytics
4	Recent Improvements in PV+Battery Modeling in NREL's System Advisor Model	Brian Mirlatz	National Renewable Energy Laboratory
5	Using Machine Learning for Predictive Modeling of Weather Impacts on Utility-scale Photovoltaic Systems	Hector Mendoza	Sandia National Laboratories
6	Technoeconomic Analysis of changing PV System Layout and Convection Heat Transfer	Matthew Prilliman	National Renewable Energy Laboratory
7	Convective Cooling of Solar Photovoltaic Modules in Unperturbed Atmospheric Conditions	Jace Davis	University of Utah
8	Effects of module configuration on convective cooling for utility-scale solar photovoltaic plants	Andrew Glick	Portland State University
9	A Photovoltaic Power Prediction Approach Enhanced by Feature Engineering and Stacked Machine Learning Model	Ibtihal Ait Abdelmoula	Hassania School of Public Works
10	Industrial Facility Electricity Cost Minimization via Renewable Energy Installation Design	Taehyoung Shim	ETRI
11	Evaluating PV Field Grounding Performance with Simulations for Lightning Transient Energy	Steven Weber	DEHN
12	Angular Response Correction Factors for Comparing PV Reference Cells and Thermopile Pyranometers	Michael Gostein	Atonometrics
13	Fault Detection and Location on Photovoltaic Systems using Spread Spectrum Time Domain Reflectometry	Samuel Hansen	University of Utah
14	The WRF-Solar Ensemble Prediction System: Development, Test, and Validation	Managit Sengupta	National Renewable Energy Laboratory
15	Overview of the Best Practices and Standards Development for the Collection and Use of Solar Resource Data for Solar Energy Applications	Aron Habte	National Renewable Energy Laboratory
16	How to Check if Your Solar Photovoltaic System Is Measuring Up to Expectations	Kenneth Sauer	VDE Americas
17	Outdoor Performance and Monitoring of Perovskite Photovoltaics	Michael Deceglie	National Renewable Energy Laboratory
18	Improving Analysis Methods for IEC 61853 Matrix Measurements	Steve Ransome	SRCL
19	Load Matching Renewable Plus Storage System Modeling in NREL SAM	Will Hobbs	Southern Company
20	The Triple-C Method for Correctly Simulating PV Clipping Loss	Tim Townsend	South Face Solar
21	Estimating subhourly clipping from hourly data: a simplified approach	Allison Mueller	Avangrid
22	Advanced Pre-Construction Loss Modeling	Halley Darling	UL
23	A general bifacial photovoltaic device method to predict system performance with albedo	Erin Tonita	University of Ottawa