

2018 PV Systems Symposium

Agenda

Color Key	
PV Performance Track	Grid Integration Track

Start	End	
Monday, April 30, 2018		
16:00	17:00	CFV lab tour Jim Crimmins, CFV Solar Test Laboratory

Tuesday, May 1, 2018		
7:00	8:00	Breakfast (Alvarado D)
7:00	8:00	Registration (Alvarado D entry)
8:00	8:20	Welcoming Address: Joshua S. Stein (Sandia) "The Disruption of Future PV Developments" (Alvarado D)
PVPMC/PV Performance Track – PV Measurements and Standards (Alvarado D)		
8:20	8:30	Jim Crimmins (CFV Solar) "Overview of Module Characterization and Measurement Standards as Inputs to Performance Models"
8:30	8:50	Dean Levi (NREL) "Improvements in Module Calibration and Their Impact on World-Wide Intercomparisons"
8:50	9:10	Ben Bourne (SunPower) "Methodology to Obtain System-Specific Thermal Response Coefficients for Use in PVsyst"
9:10	9:30	Govindasamy Tamizhmani (ASU) "Indoor Soil Deposition Chamber: Validation of Anti-Soiling Coating Claims"
9:30	9:50	Daniel Zirzow (CFV Solar) "Improvements in CFV's Outdoor IAM Measurement Method"
9:50	10:20	Morning Break and Posters (East Atrium)
10:20	10:40	Kyumin Lee (CFV Solar) "Creating PAN Files from IEC 61853-1 Test Data: Why Using Datasheet I-V Values is a Bad Idea"
10:40	11:00	Markus Schweiger (TUV Rheinland) "IEC 61853 energy rating of PV modules - Measurement methods and lessons learned"

11:00	11:20	Peter Johnson (AWS Truepower/UL) "Consideration of Test Lab Reports to Support Bankable Energy Estimates"
11:20	12:00	Roundtable Discussion
12:00	13:00	Lunch (Alvarado AB)
PVPMC/PV Performance Track – Solar Resource Assessment for PV (Alvarado D)		
13:00	13:20	Kees van den Bos (Hukseflux) "Latest Developments in Solar Measurements"
13:20	13:40	Patrick Keelin (Clean Power Research) "Detailed Analysis using DNI and DHI ground-based measurements to tune satellite model"
13:40	14:00	Manajit Sengupta (NREL) "Update of the National Solar Radiation Database (1998-2016): Version 3"
14:00	14:20	Josh Peterson (University of Oregon) "Calibration methodology of the University of Oregon Solar Radiation Monitoring Laboratory"
14:20	14:40	Anton Driesse (PV Performance Labs) "Irradiance. What is your sensor really telling you?"
14:40	15:20	Afternoon Break and Posters (East Atrium)
PVPMC/PV Performance Track – Improving PV Performance (Alvarado D)		
15:20	15:40	Jim Augustyn (Augustyn & Co./Solar Cat Industries) "Measuring Maximum Plane-of-Array Irradiance"
15:40	16:00	Marios Theristis (Univ. of Cyprus) "Advanced Failure Diagnostic Approach for Grid-Connected Photovoltaic Systems"
16:00	16:20	Joe Walters (Univ of Central Florida) "LCOE Reduction Through Proactively Optimized PV System Monitoring"
16:20	16:40	Jaewon Oh (ASU-PRL) "Decreasing PV Module Temperature with Thermally Conductive Backsheets"
16:40	17:00	Roundtable Discussion
18:00	19:30	PVPMC/PV Performance Track --Networking Reception Pavilion --
19:30		Dinner on your own

Wednesday, May 2, 2018		
7:00	8:00	Breakfast (Alvarado D)
7:00	8:00	Registration (Alvarado D entry)
PVPMC/PV Performance Track – PV Performance Models (Alvarado D)		
8:00	8:20	Ben Bourne (SunPower) “A 10-Year Retrospective on PV Performance Modeling”
8:20	8:40	Janine Freeman (NREL) “System Advisor Model Updates”
8:40	9:00	Mark Mikofski (DNV-GL) “SolarFarmer – Accurate Modeling of Real World PV Systems”
9:00	9:20	Bruno Wittmer (PVsyst) “Horizontal Axis Trackers with Bifacial Modules in PVsyst”
9:20	9:40	Stephen Kaplan (First Solar) “PlantPredict Update and SDK development for API”
9:40	10:00	Defne Gun (SunPower) “Dynamic Snow Loss Model in PVSIM: Modeling Impact of Snow on PV Production”
10:00	10:40	Morning Break and Posters (East Atrium)
10:40	11:00	Amir Asgharzadeh Shishavan (Univ. of Iowa) “Bifacial PV System Performance: Investigation of Diffuse Shading Conditions”
11:00	11:20	Steve Ransome (Gantner) “Using similar mathematical modelling with both single module IV curve measurements and array inverter data”
11:20	11:40	Didier Thevenard (Canadian Solar) “Reconciling a Simulation Model with Measurements”
11:40	12:00	Peter Johnson (AWS Truepower /UL) “Do Preconstruction Estimates Align with Operational Performance?”
12:00	12:20	Roundtable Discussion
12:20	13:20	Lunch (Alvarado AB)
PVPMC/PV Performance Track – Open Source Tools for PV modeling and monitoring		

(Alvarado D)		
13:20	13:40	Dana Olson (DOE) “Accelerating PV Cost Reduction through an Open-Source Software Ecosystem for Performance Modeling and Data Standardization”
13:40	13:50	Will Holmgren (UA) “Review of open source tools for PV modeling”
13:50	14:00	Michael Deceglie (NREL) “RdTools: an Open Source Python Library for PV Degradation Analysis”
14:00	14:10	Cliff Hansen (Sandia) “SunSpec Orange Button: Open Source Data Taxonomy and Software for PV”
14:10	14:20	Janine Freeman (NREL) “Open-Sourcing of NREL’s System Advisor Model”
14:20	14:30	Kate Klise (Sandia) “Pecos – Open Source Software for PV System Monitoring”
14:30	14:40	Cliff Hansen (Sandia) “PVLIB Update”
14:40	15:20	Afternoon Break and Posters (East Atrium)
15:20	16:45	Guided Discussion on Open Source Tools for PV Modeling – Strategies and Future Directions
16:45	17:00	Joshua Stein (Sandia) “Summary and Overview of PVPMC Workshop and Future Needs”

Wednesday, May 2, 2018		
7:00	8:00	Breakfast (Alvarado D)
7:00	8:00	Registration (Alvarado D entry)
Grid Integration Track – Workshop on IEEE 1547 (Location)		
8:00	10:00	<p>EPRI, NREL, and Clemson Univ. Organizer: Tom Key</p> <ul style="list-style-type: none"> • Review typical screening practices in current use, how we got here. • Updating expectations from screening and commissioning • Revisiting screening with updated technical objectives/options, what does FERC SGIP have to do with distribution operation and planning? • Value of a screening hierarchy for efficiency and decision making • Taking advantage of increasing interconnection experience, better engineering judgement and improved data access and analysis tools
10:00	10:40	Morning Break (East Atrium)
10:40	12:00	<p>Workshop on IEEE 1547 Continued</p> <ul style="list-style-type: none"> • Deciding on grid support options to mitigate interconnection issues • Bringing energy storage into the mix • Evolving practices for high penetration cases • Evolving practices to consider emerging power quality issues • Better use of supplemental screening when preliminary fails • Defining application-specific commissioning test regiment.
12:00	13:00	Lunch (Alvarado AB)
Grid Integration Track – Workshop on Understanding DERMS – DER Aggregation, Optimization and Integration.		
13:00	14:40	<p>Organizers: Ajit Renjit (EPRI), Tanguy Hubert I (EPRI), & Daniel Spaizman (SDG&E)</p> <ul style="list-style-type: none"> • DERMS – Origin and Definition • DER group management functions – an overview • Need for interoperable protocols that support group management functions

14:40	15:20	Afternoon Break (East Atrium)
15:20	17:00	<ul style="list-style-type: none"> • Plug-and-Play with EPRI's DER integration toolkit • DER integration timeline and the role of DERMS
18:00	19:30	Grid Integration Track --Networking Reception Pavilion

Thursday, May 3, 2018		
7:00	8:00	Breakfast (Alvarado D)
9:00	10:00	CFV lab tour Jim Crimmins, CFV Solar Test Laboratory
Grid Integration Track – Workshop: Firming and Shaping Renewables (Alvarado C)		
8:00	8:30	Welcoming Address: Dr. Charlie Gay Director of the U.S. Department of Energy Solar Energy Technologies Office He leads a team that is dedicated to early-stage research and development of solar technologies, with a focus on how they contribute to supporting the reliability, resilience, and security of the U.S. electric grid. (Alvarado C)
Grid Integration Track – PV and Storage at the Bulk and Distribution System (Alvarado C)		
8:30	9:40	Utility Experience with PV+ Storage <ul style="list-style-type: none"> • Jon Hawkins (PNM): Topic Area: Pursuing PV+ storage • Tucson Electric (Invited): Demonstrating Large PV with Energy Storage • TBD
9:40	10:00	Nicholas DiOrio (NREL) & Will Hobbs (Southern Company) "Economic dispatch for DC-connected battery systems on large PV plants"
10:00	10:40	Morning break (East Atrium)
10:40	11:00	Ray Byrne (Sandia) "Control of PV+ Storage"
Grid Integration Track – Solar + X = Higher Value (Alvarado C)		
11:00	11:20	Arindam Maitra (EPRI): Hydro One: "Utilizing energy storage to improve distribution reliability"

11:20	11:40	Robert Broderick (Sandia): “Resilient microgrids in Puerto Rico with high levels of renewables. Technical and regulatory experience”
11:40	12:00	Huijuan Li (EPRI) “Identifying best mitigation options for higher PV penetration in New York distribution grid”
12:00	13:00	Lunch (Alvarado AB)
Grid Integration Track – Monitoring and control with High PV penetration (Alvarado C)		
13:00	13:25	Aminul Huque (EPRI) “Impact of Reactive Power Control Functions on Active Power Generation”
13:25	13:50	Matt Lave (Sandia) “Parameter and Topology Estimation Using Utility AMI Data”
13:50	14:15	Yingchen Zhang (NREL) “Predictive data analytics for enhanced observability at grid edge
14:15	14:40	Rohit Moghe (Varentec) “Grid Edge projects in Hawaii”
14:40	15:20	Afternoon break (East Atrium)
Grid Integration Track – Planning, operating and protection the system with Advanced Inverters (Alvarado C)		
15:20	15:40	Nicolas Heine (EPRI): Automating and Expediting Circuit Analysis using DRIVE tool
15:40	16:00	Matt Reno (Sandia): “Advanced Inverter Planning: Voltage and Protection”
16:00	16:20	Andy Hoke (NREL) “Fast Grid Frequency Support from Distributed Inverter-based Resources”
16:20	16:40	Utility (TBD)
16:40	17:00	Wrap Up
17:00		End of Symposium

Poster Presentations

1. **Will Hobbs** (Southern Company) "Fast In-Field Imaging of PV Modules for Crack Detection: Methods, Results, and Modeling Implications"
2. **Bill Stueve** (Atonometrics) "Eliminating Back-of-Module Temperature Sensors for Reference Modules Using Voc Temperature Measurement"
3. **Rakeshkumar Mahto** (Calif State University, Fullerton) "Modeling Technique for Reconfigurable PV Module Embedded with CMOS Switches"
4. **Archana Sinha** (ASU-PRL) "Degradation Rate Modeling for Encapsulant Discoloration of Photovoltaic Modules"
5. **Jaewon Oh** (ASU-PRL) "Determination of Sandia Thermal Model Coefficients and ΔT for PV Modules with New Backsheet Types"
6. **Deborah Gross** (Blue Oak Energy) "Use of minute interval simulated irradiance data to increase accuracy of energy production models for PV systems with high inverter loading ratios"
7. **Jon Allen** (Allen Analytics) "The Effect of Short-Term Inverter Saturation on PV Performance Modeling"
8. **Laurie Burnham** (Sandia) "International Collaborative to Advance Multi-Climate PV Performance Research"
9. **Gregory Kimball** (SunPower) "Improved model of solar resource variability based on regional aggregation and skew normal distributions and modeling assumptions for solar project financing"
10. **Angele Reinders** (University of Twente) "EU COST Action PEARL PV: Performance and Reliability of Photovoltaic Systems: Evaluation of large-Scale Monitoring Data"
11. **Marios Theristis** (University of Cyprus) "Optimum PV power forecasting modelling based on artificial neural networks"
12. **Marios Theristis** (University of Cyprus) "EU COST Action PEARL PV: Performance and Reliability of Photovoltaic Systems: Evaluation of large-Scale Monitoring Data; WG5 PV in grids"
13. **Braden Gilleland and Will Hobbs** (Southern Company) "Cloud speed data for solar plant ramp rate analysis"
14. **Kevin Murray** (University of Belfast) "Irradiance ramp-rates in solar PV generation in high penetration feeders"
15. **Jaya Mallineni & Chris Raupp** (Solv/Swinerton) "Performance & Production: Bifacial vs. Mono-facial PV Technologies"
16. **Erin Whitney & Chris Pike** (University of Alaska, Fairbanks) "New Bifacial Solar Photovoltaic Test Site in Fairbanks, Alaska"
17. **Lauren Ngan and Rob van Haaren** (First Solar) "Battery Storage Modeling in PlantPredict"
18. **Richard Beal** (Spectrafy Inc.) "Towards routine measurement and use of solar spectral irradiance data"
19. **Anton Driesse and Neel Patel** (PV Performance Labs) "Cross-validation of PV Simulation Software"

20. **Silvana Ayala** (University of Arizona) "Comparison of bifacial solar irradiance models predictions with field validation"