

PV Performance Laboratory

Dr Christopher Fell | Principal Research Scientist – PV Performance Laboratory

21 November 2014

ENERGY FLAGSHIP

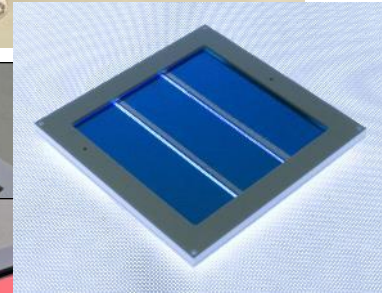
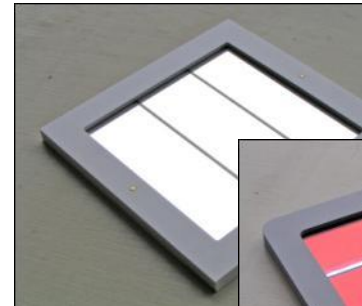
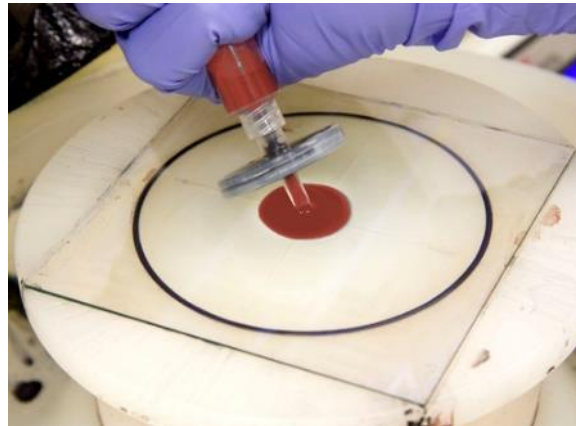
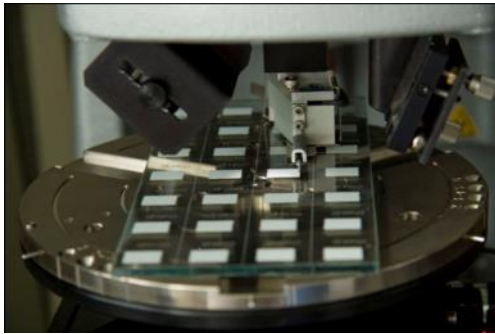
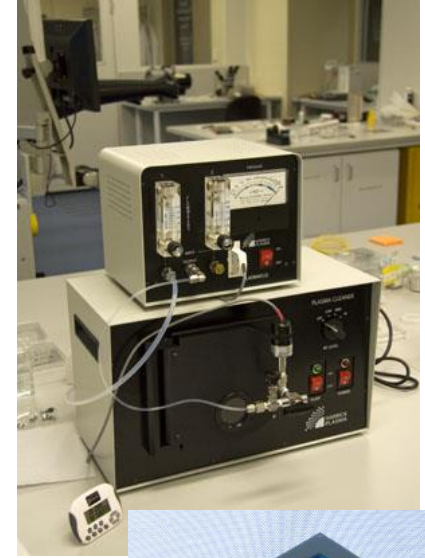
www.csiro.au





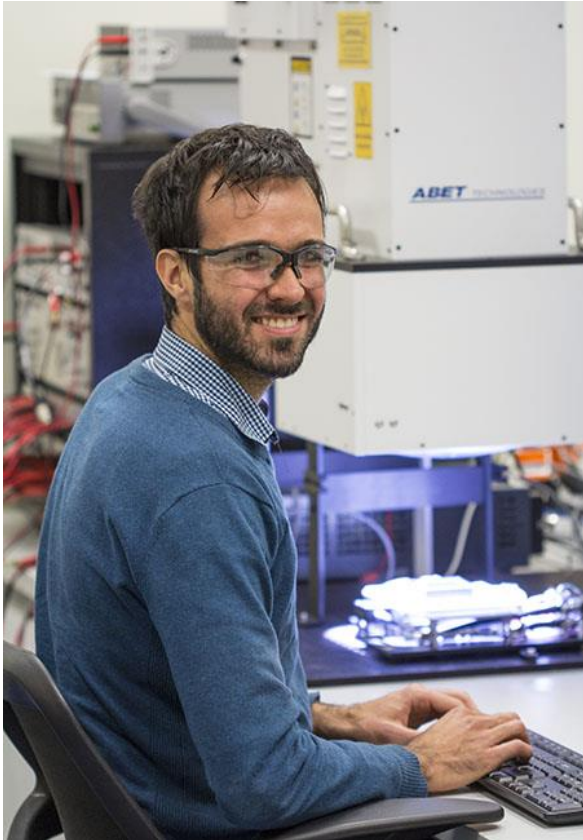
OPV device research since 2005

OPV fabrication

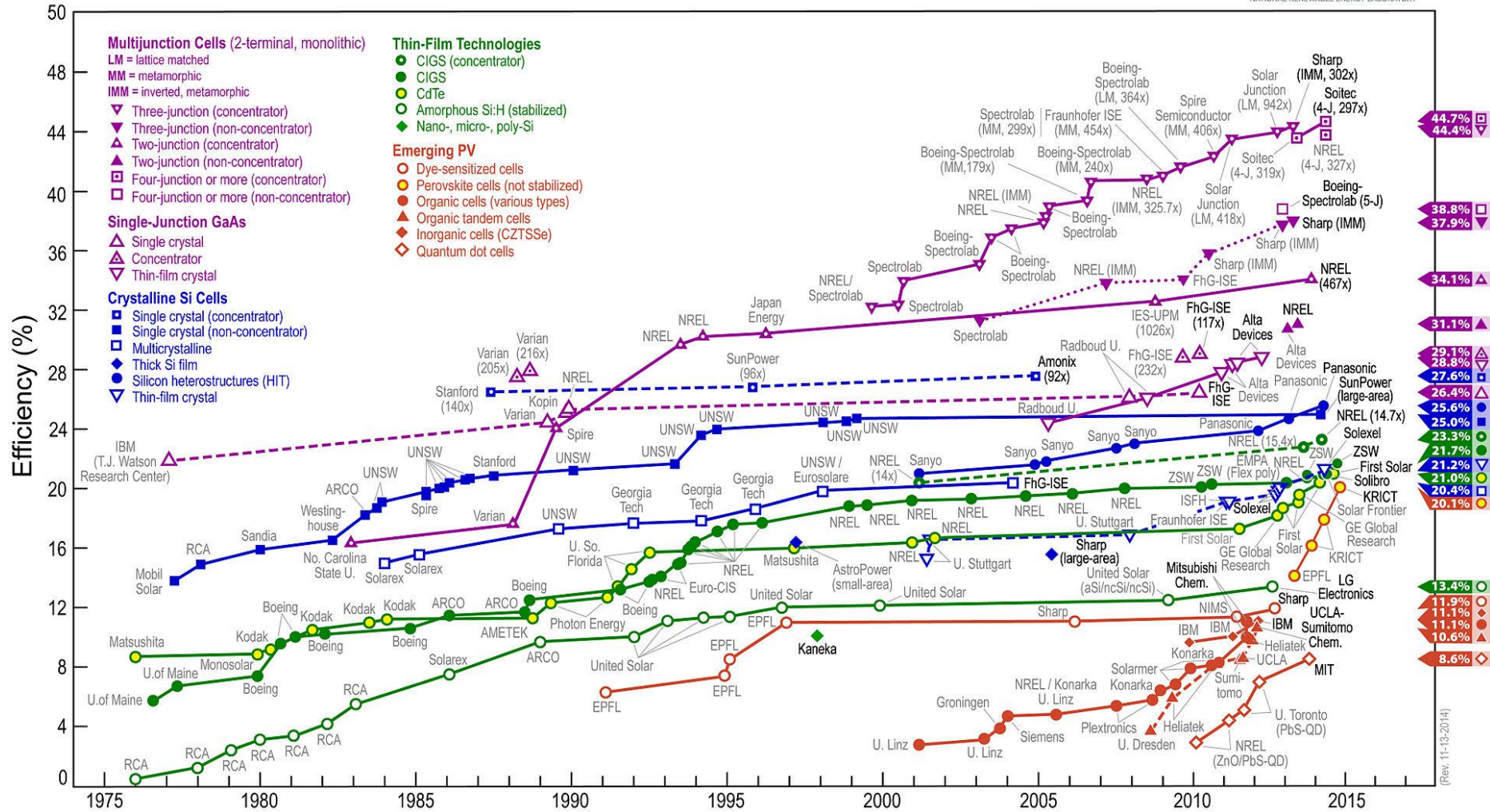


PV Performance Laboratory

Standardising PV measurements in Australia; understanding performance and durability under Australian conditions; supporting an Australian PV industry..

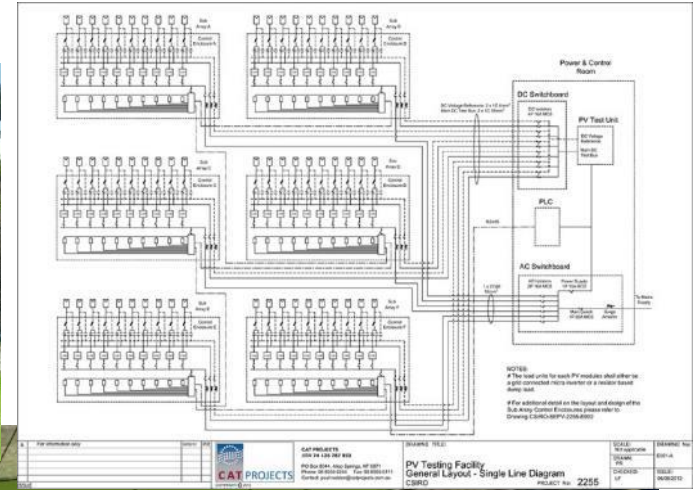
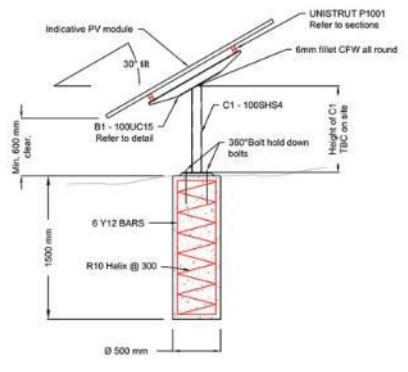
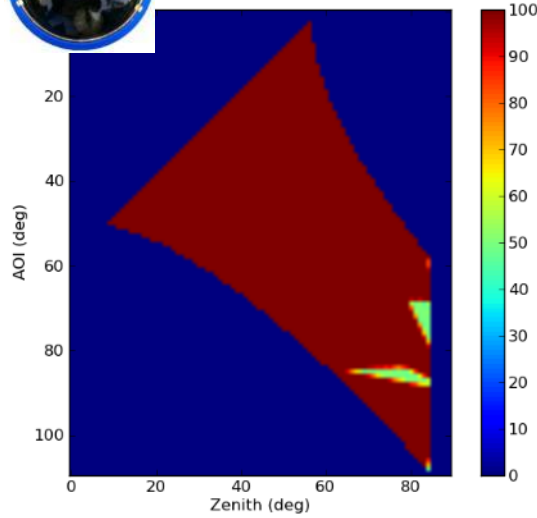
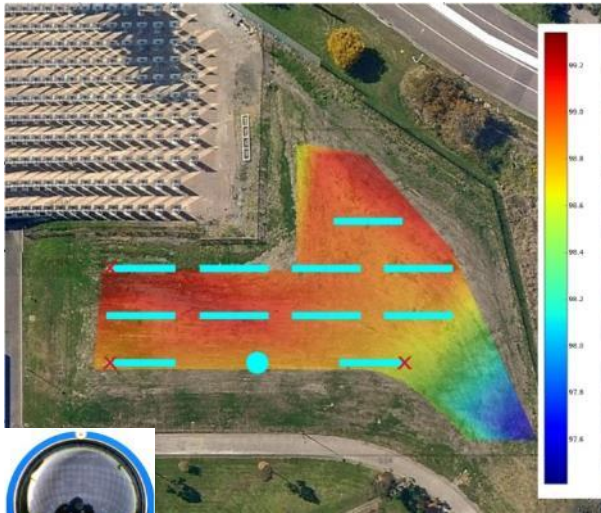


Best Research-Cell Efficiencies



(Rev. 11-18-2014)

PV outdoor research facility







PV Outdoor Research Facility

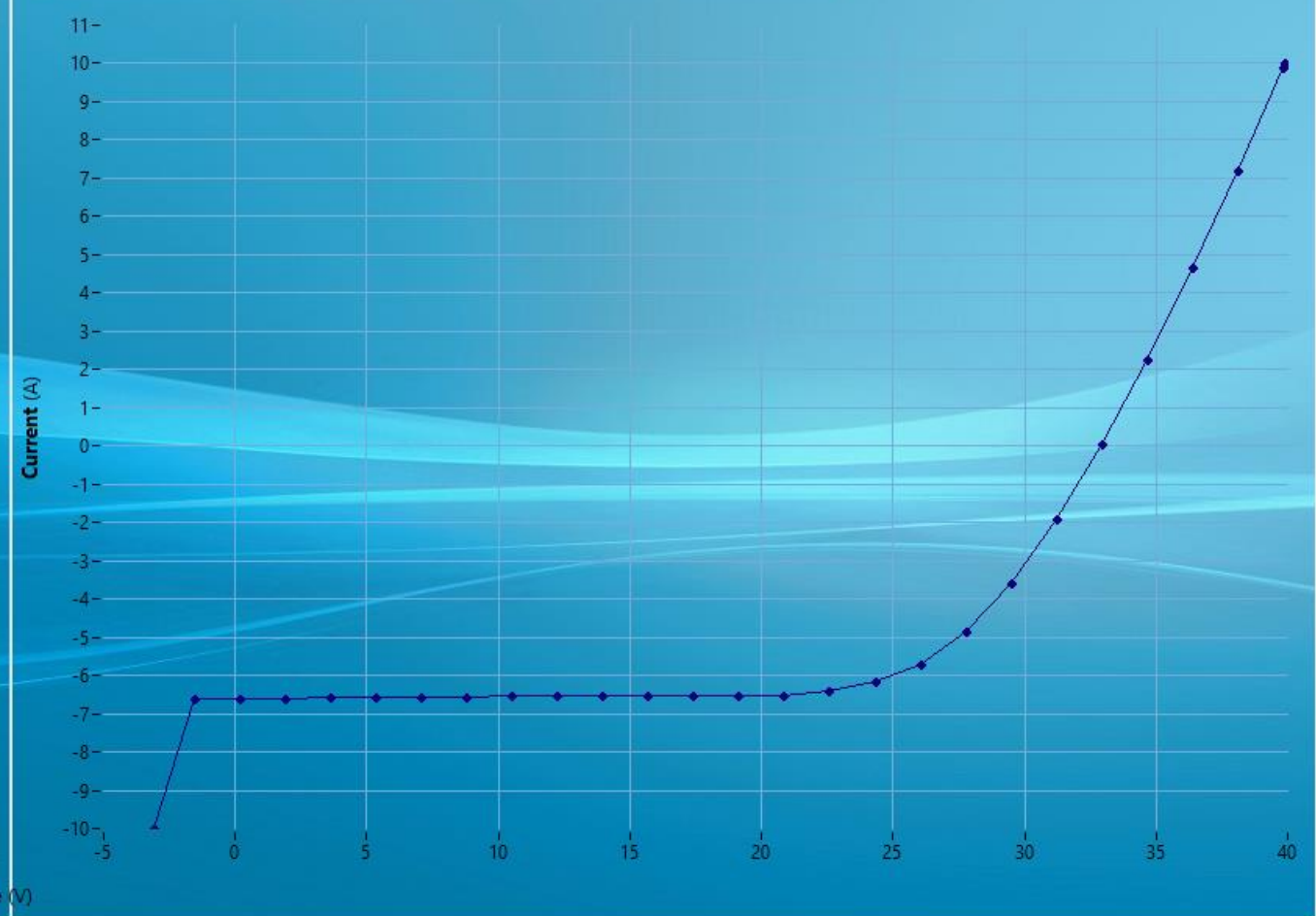
Module Control System: Live Data Viewer

PV Module Test Sequence

Module Name	Location	Time	Done?
1011401100028	01-04	2:30:39 PM	<input type="radio"/>
101207272100729	01-05	2:30:51 PM	<input type="radio"/>
101207272200681	01-06	2:30:56 PM	<input type="radio"/>
10134800012009429	01-07	2:31:09 PM	<input type="radio"/>
10134800012009104	01-08	2:31:14 PM	<input type="radio"/>
10134800012009438	01-10	2:31 PM	<input checked="" type="radio"/>
10134800012009426	01-11	2:31 PM	<input checked="" type="radio"/>
127960000134015	03-01	2:31 PM	<input checked="" type="radio"/>
127960000134022	03-02	2:31 PM	<input checked="" type="radio"/>
101119040006	03-03	2:31 PM	<input checked="" type="radio"/>
101120040176	03-04	2:31 PM	<input checked="" type="radio"/>
1012072722006013	03-05	2:31 PM	<input checked="" type="radio"/>
101207272100088	03-06	2:32 PM	<input checked="" type="radio"/>
10120001100100070	03-07	2:32 PM	<input checked="" type="radio"/>
10120001100100019	03-08	2:32 PM	<input checked="" type="radio"/>
127960000133288	03-09	2:32 PM	<input checked="" type="radio"/>
127960000133246	03-10	2:32 PM	<input checked="" type="radio"/>
10134800012009432	03-11	2:32 PM	<input checked="" type="radio"/>
1012748038000019	04-01	2:32 PM	<input checked="" type="radio"/>

Last PV Module Test Results

Module Name	Location	Temp (°C)	Start Time	End Time
10134800012009104	01-08	40.6	2:31:14 PM	2:31:19 PM







PV Outdoor Research Facility

Solar Ground Station: Live Data Viewer

Pyranometers

2:28:22 PM

Name	Irradiance (W/m ²)	Temperature (°C)	Ventilator (rev/min)	Fan?	Heat?
Pyro 1 DHI 1	284.7	30.4	2564	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Pyro 2 GHI	911.3	28.8	2558	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Pyro 3 DHI 2	293.8	29.7	2551	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Pyro 4 GTI 1	966.2	30.5	2547	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Pyro 5 GTI 2	967.7	30.6	2532	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Pyro 6 GTI 3	964.2	-25.8	0	<input type="radio"/>	<input type="radio"/>
	0	0	0	<input type="radio"/>	<input type="radio"/>

Pyrheliometer

2:28:22 PM

Irradiance (W/m ²)	Temperature (°C)
786.9	24.6

Instruments Cleaned: 08:57:50 20/02/2014

Cabinet Temperature: 30.8 °C

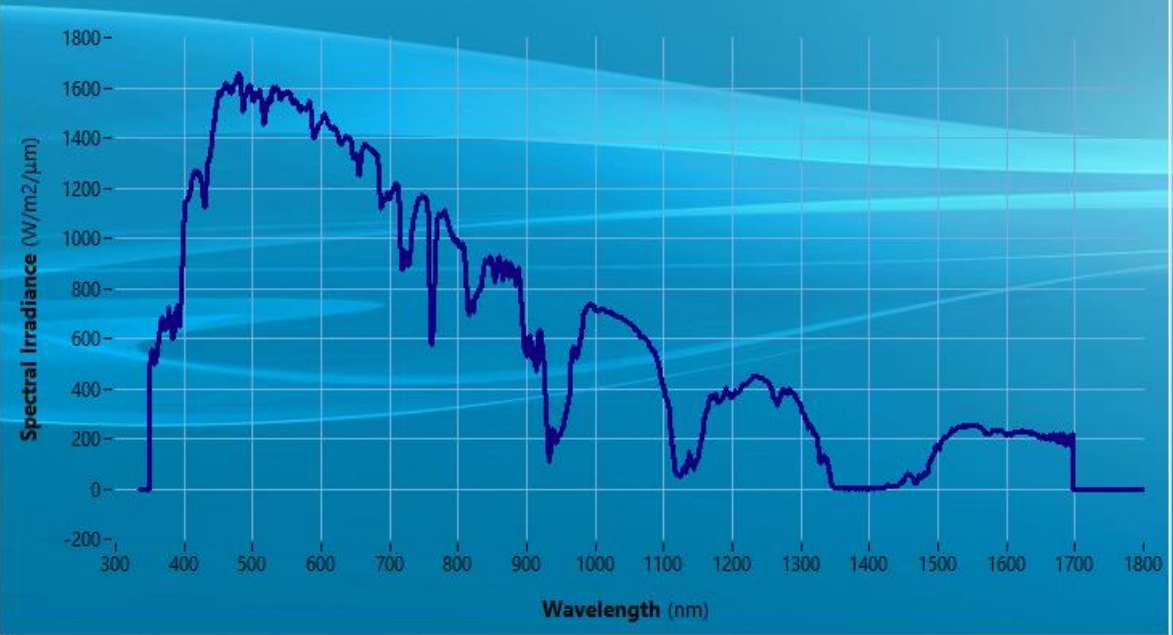
Weather Station

2:28:10 PM

Name	Data
Wind Direction (°)	101
Wind Speed (m/s)	2.7
Temperature (°C)	25.6
Humidity (%)	52.8
Pressure (Pa)	102331
Rainfall (mm)	0

Spectroradiometer

2:25:00 PM



Sky Camera

2:25:00 PM



Pyranometer Trend

Pyrheliometer Trend

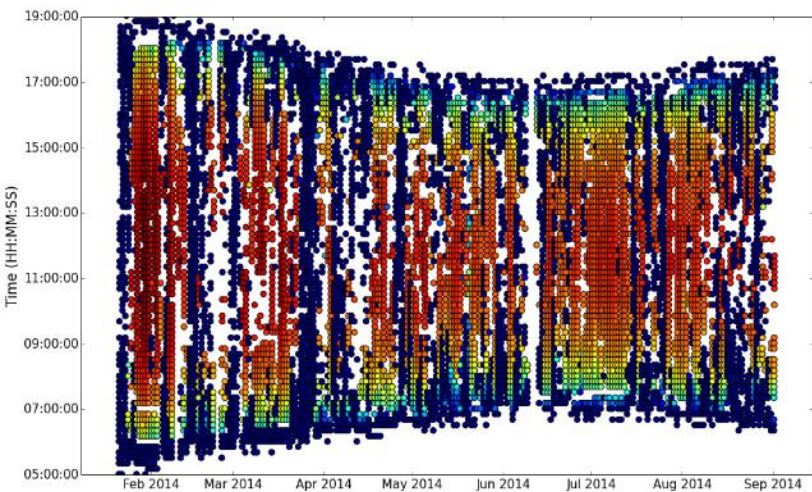
Temperature Trend

Wind Trend

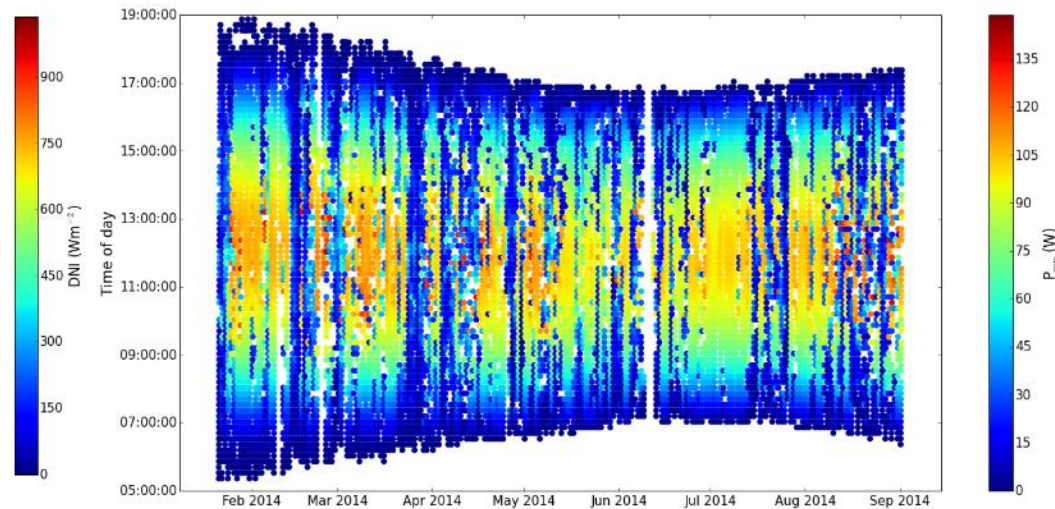
Humidity Trend

Pressure Trend

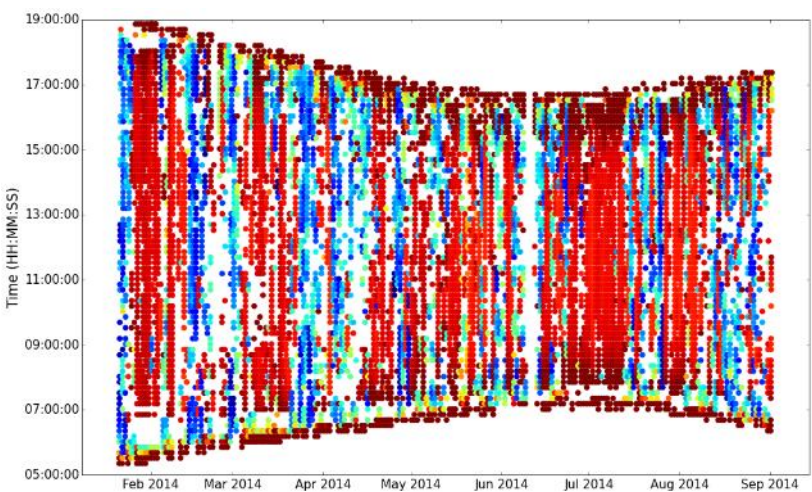
Rainfall Trend



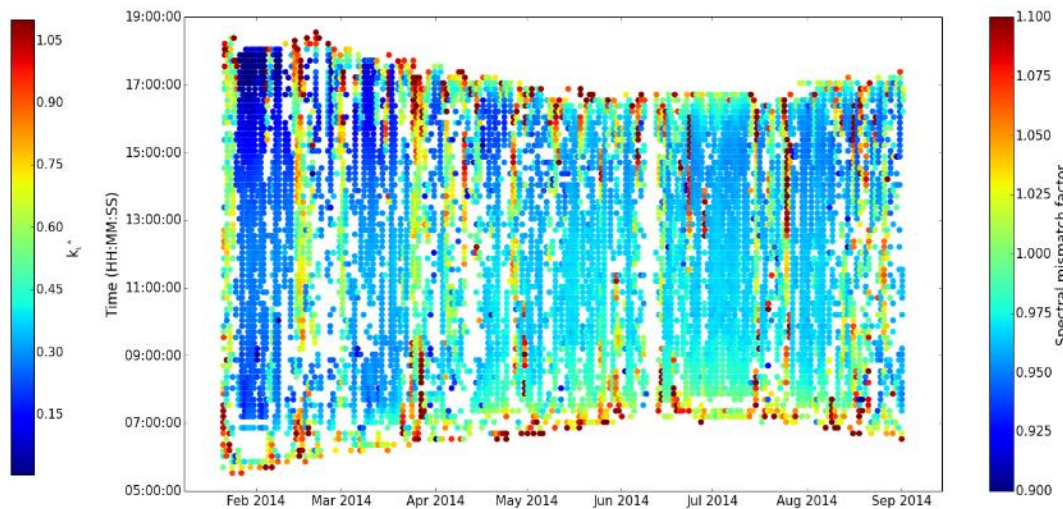
DNI



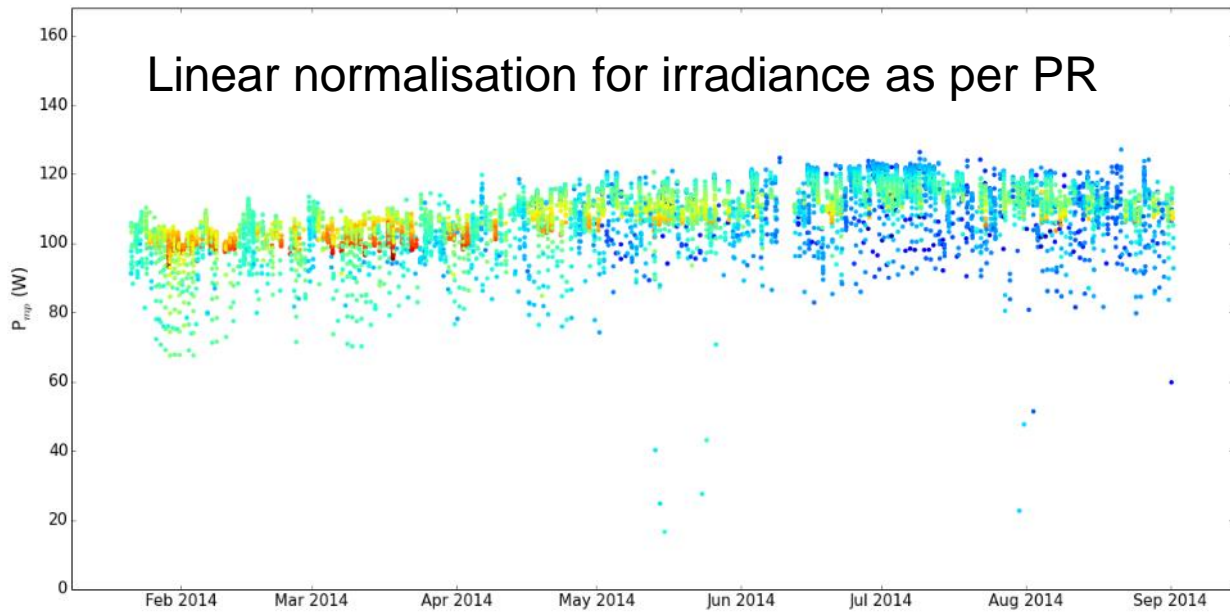
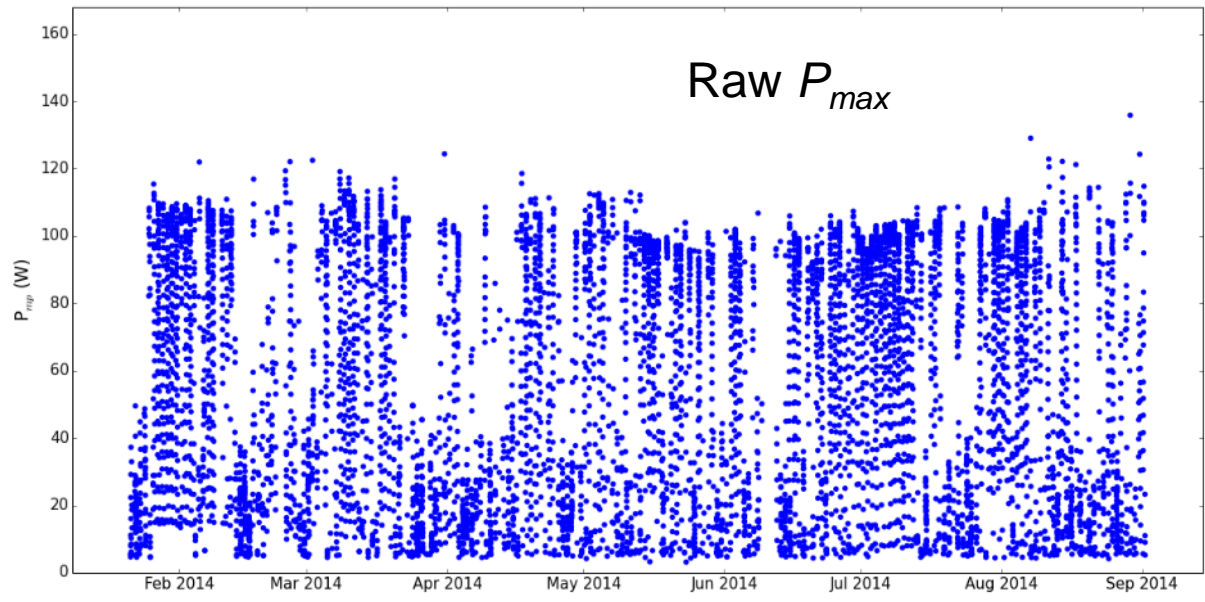
PV module output (P_{max})

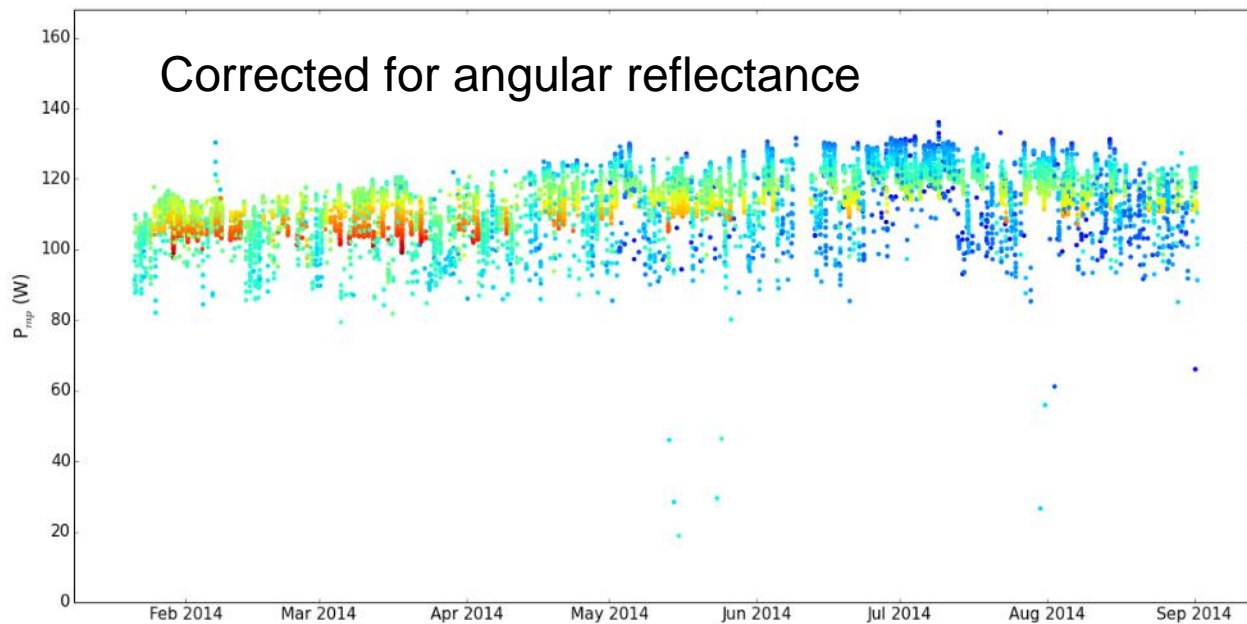
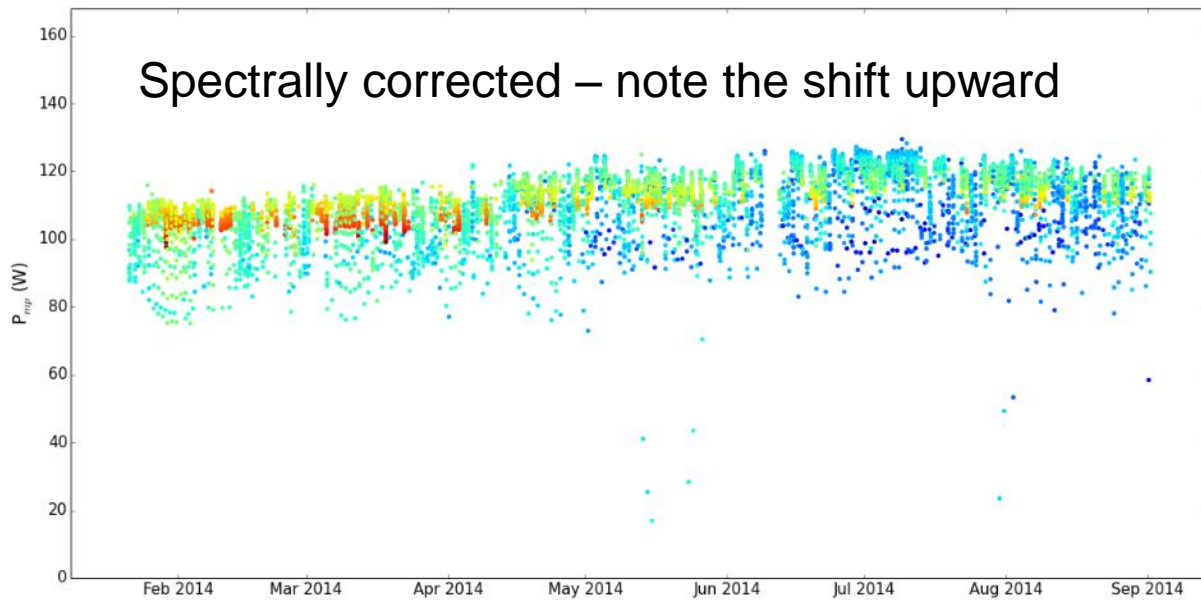


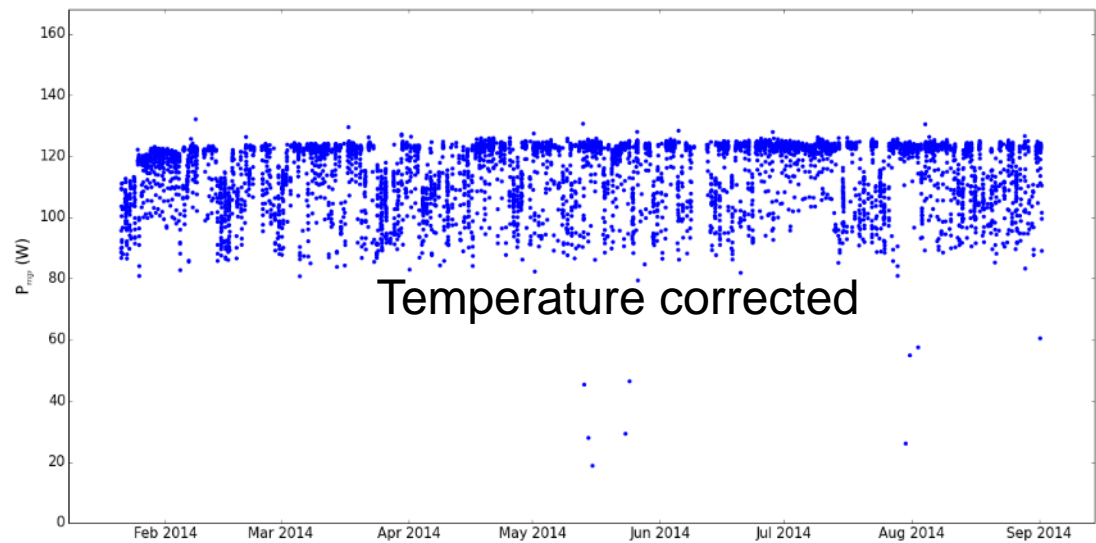
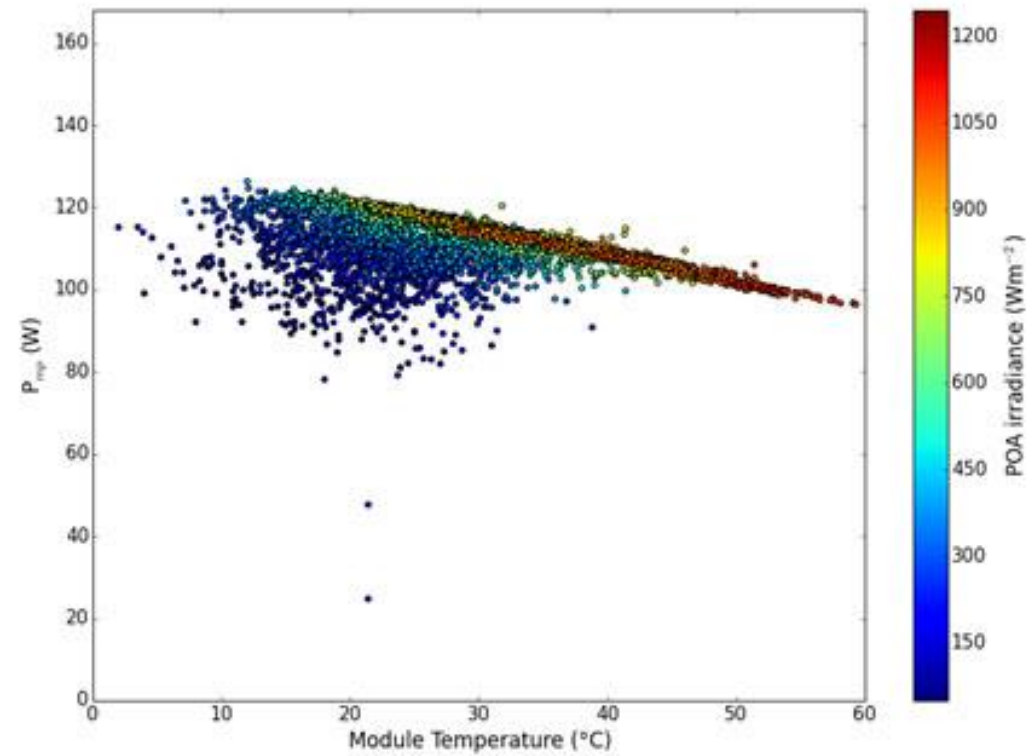
Clearness Index

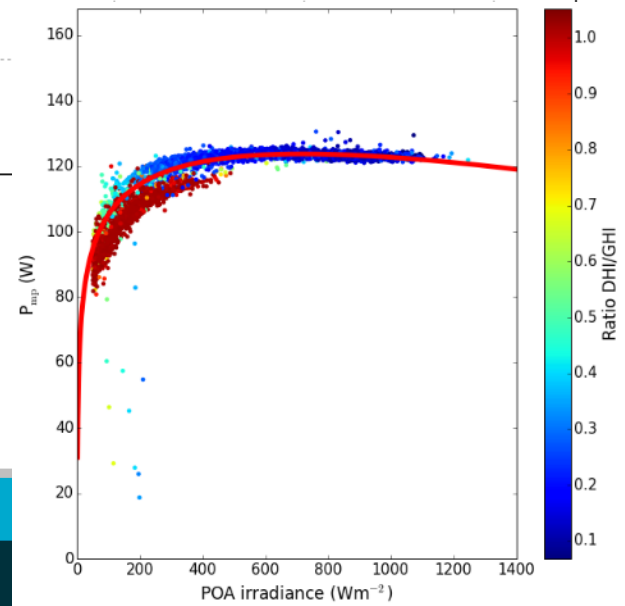
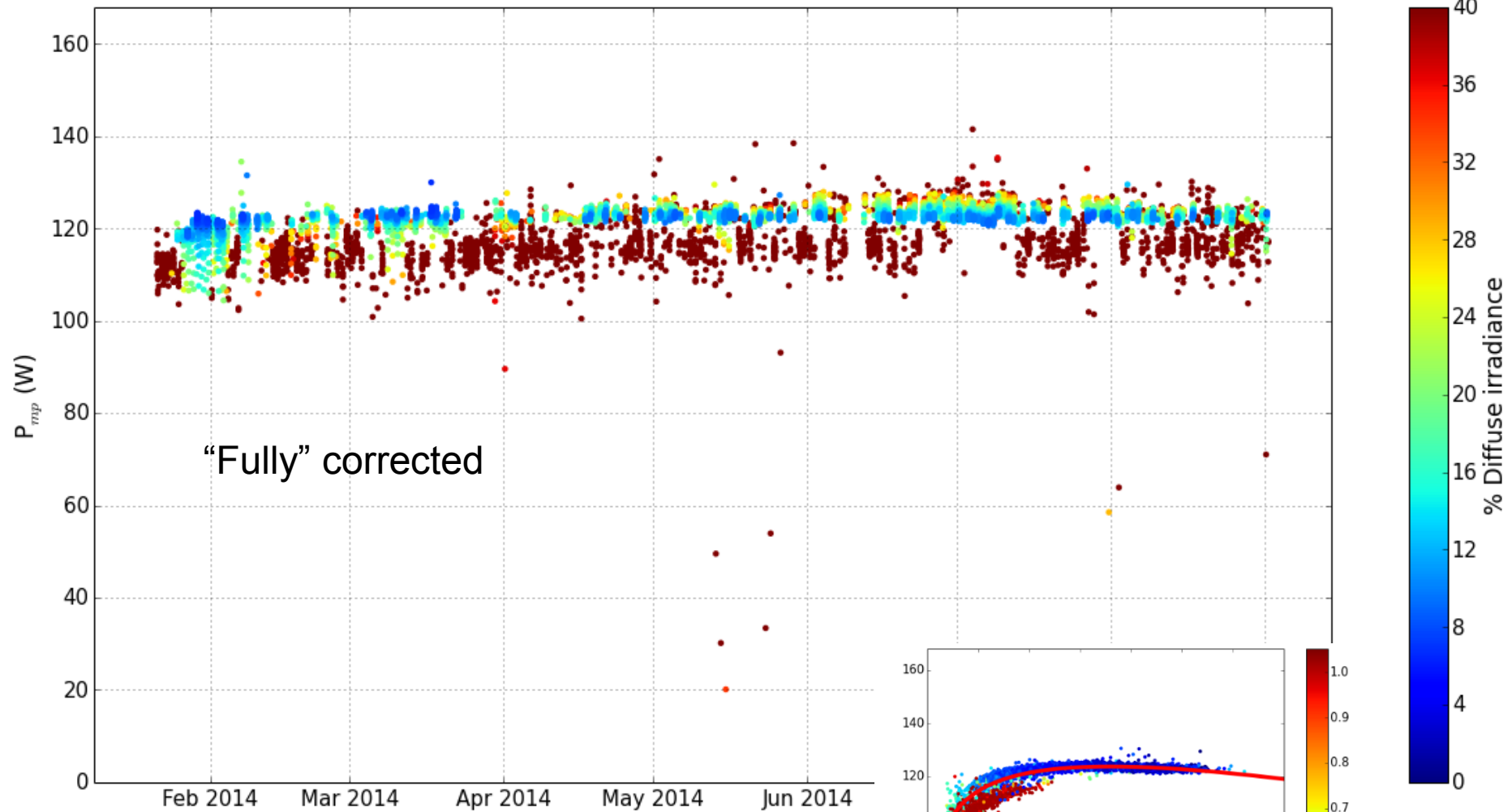


Spectral mismatch











Acknowledgement of funding source:

This project has been supported by the Australian Govt. through the Australian Renewable Energy Agency. Through ARENA, the Australian Govt. is supporting Australian research and development in solar photovoltaic and solar thermal technologies, to help solar power become cost competitive with other energy sources. The views expressed herein are not necessarily the view of the Australian Govt. and the Australian Govt. does not accept any responsibility for any information or advice contained herein.

Thank you

Dr Chris Fell

Principal Research Scientist – PV Performance Laboratory

t +61 2 4060 6032

e chris.fell@csiro.au

w www.csiro.au

ENERGY FLAGSHIP

www.csiro.au

