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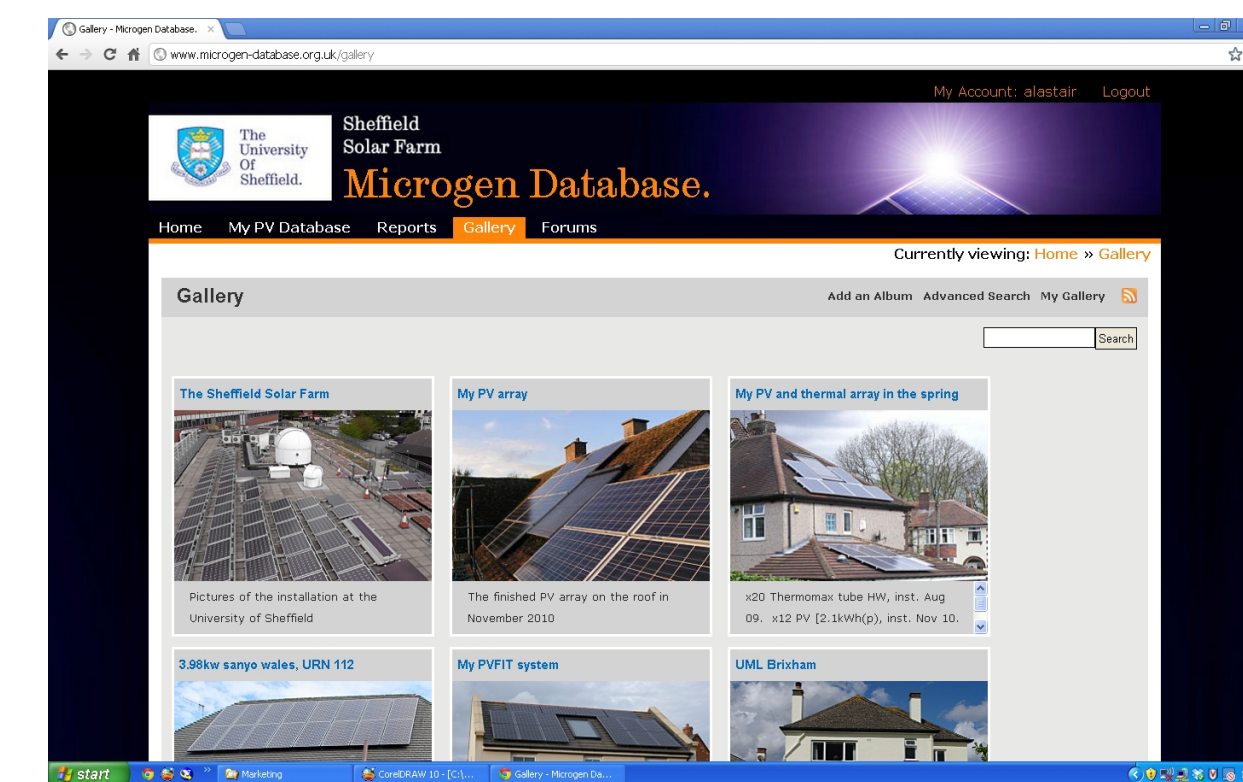
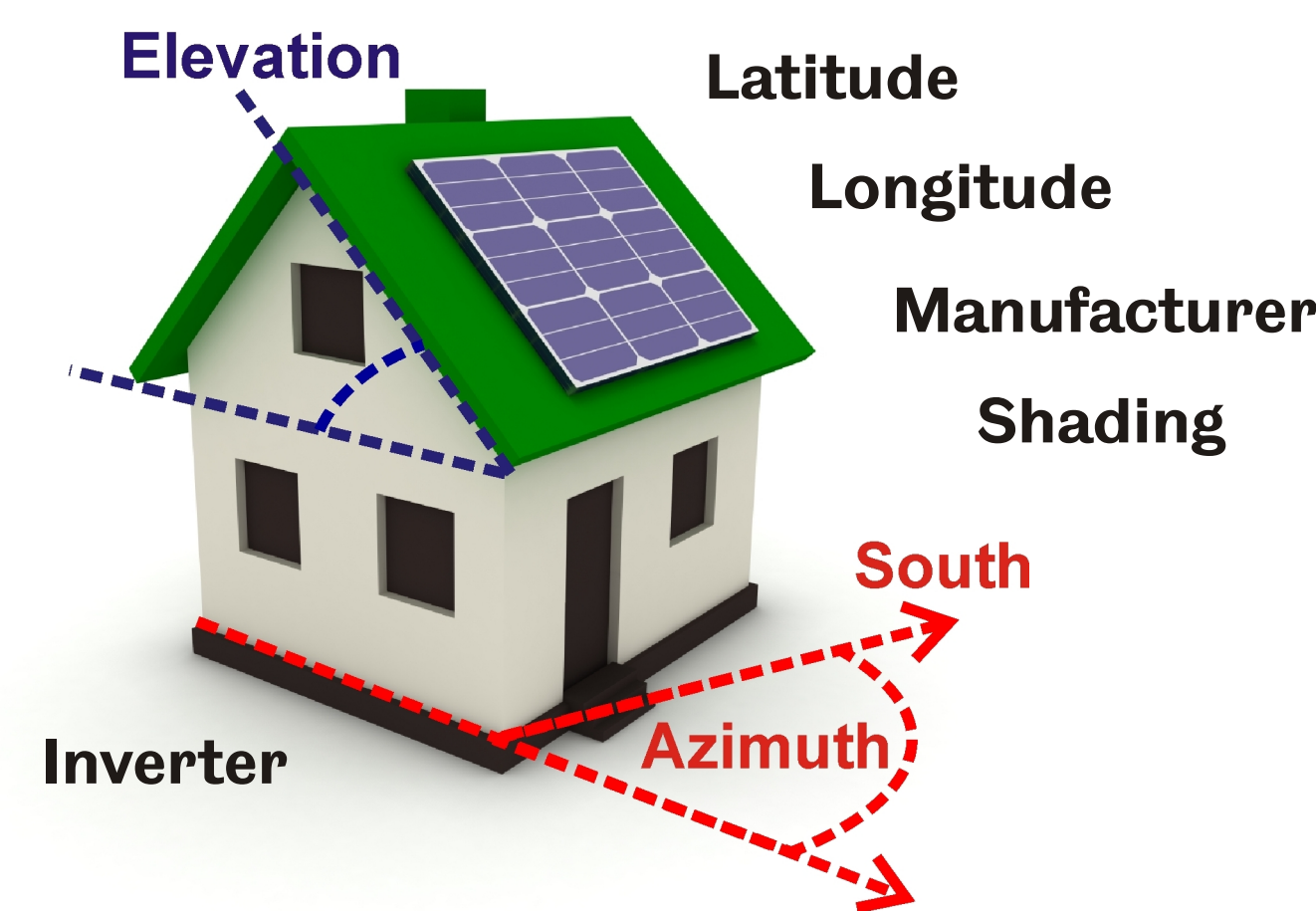
The Sheffield Solar Farm Solar Photovoltaic Microgeneration Database

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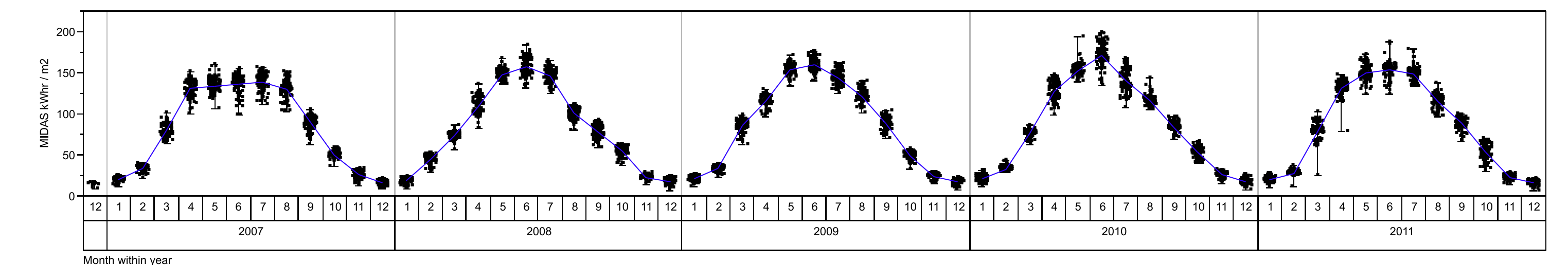
An academic - public collaborative www.microgen-database.org

1. Photovoltaic energy yield is recorded by data donors
2. Solar irradiance data is collected from the Met office
3. Solar PV Installation efficiency is calculated monthly
4. A monthly performance report is published for each donor

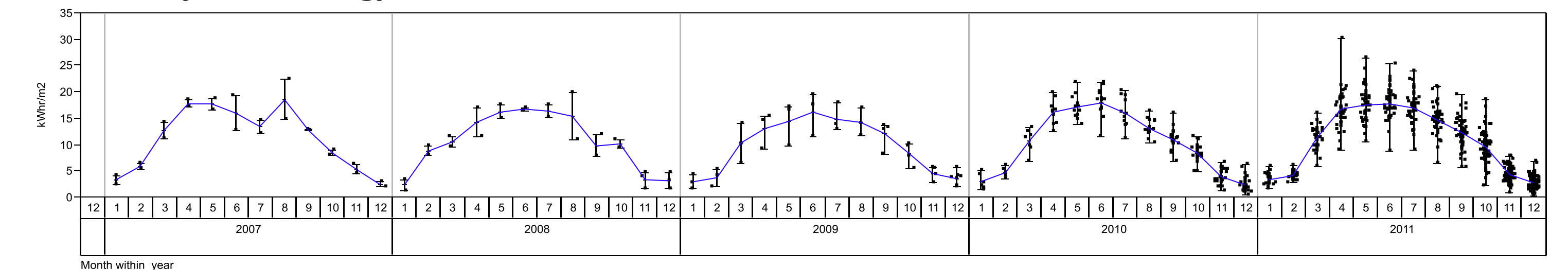


Monthly solar energy data

Monthly Global Horizontal Solar Energy (interpolated at each installation from MIDAS dataset)



Monthly Solar Energy Yield (for each installation)



www.sheffield.ac.uk/solarfarm

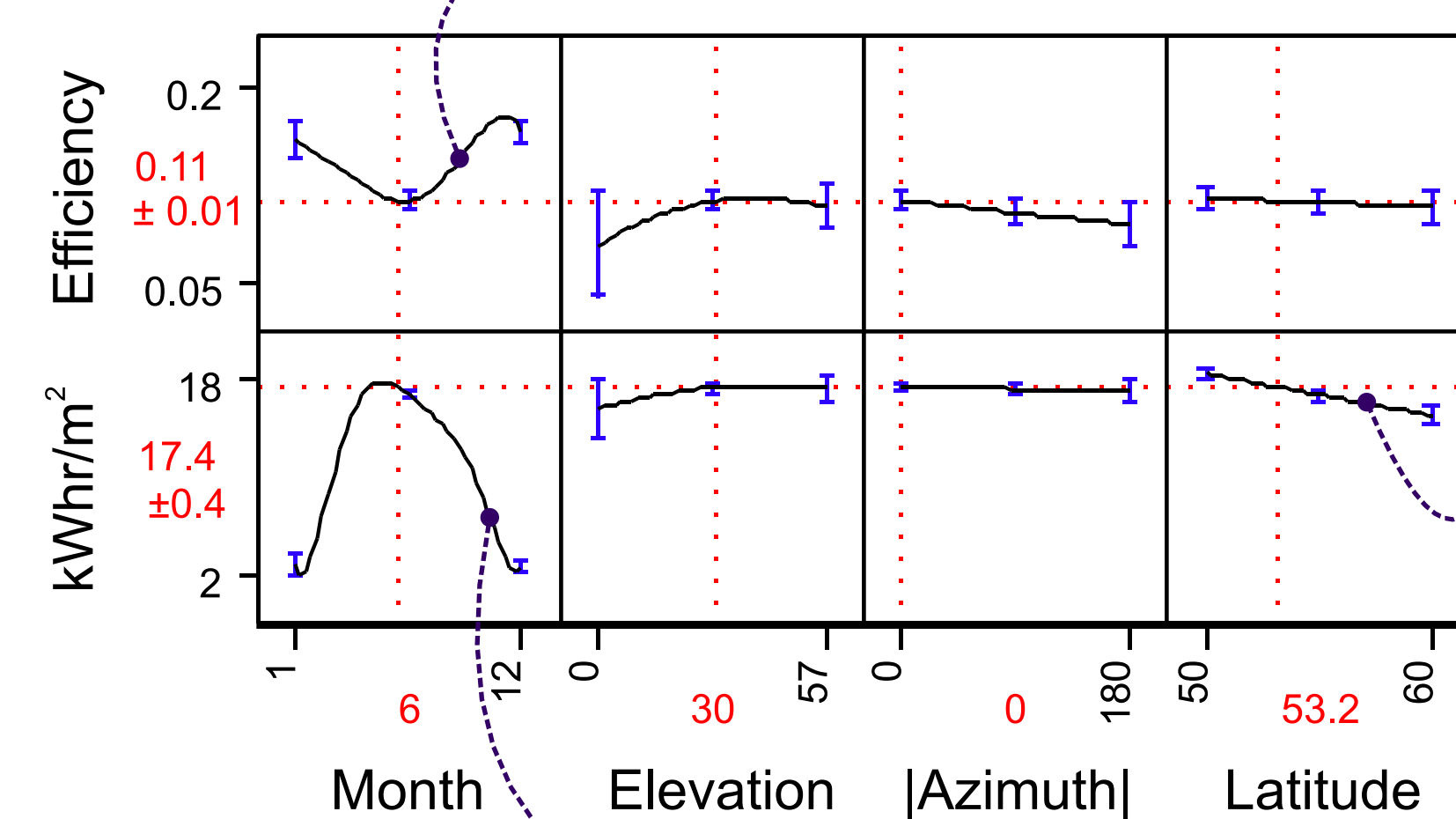
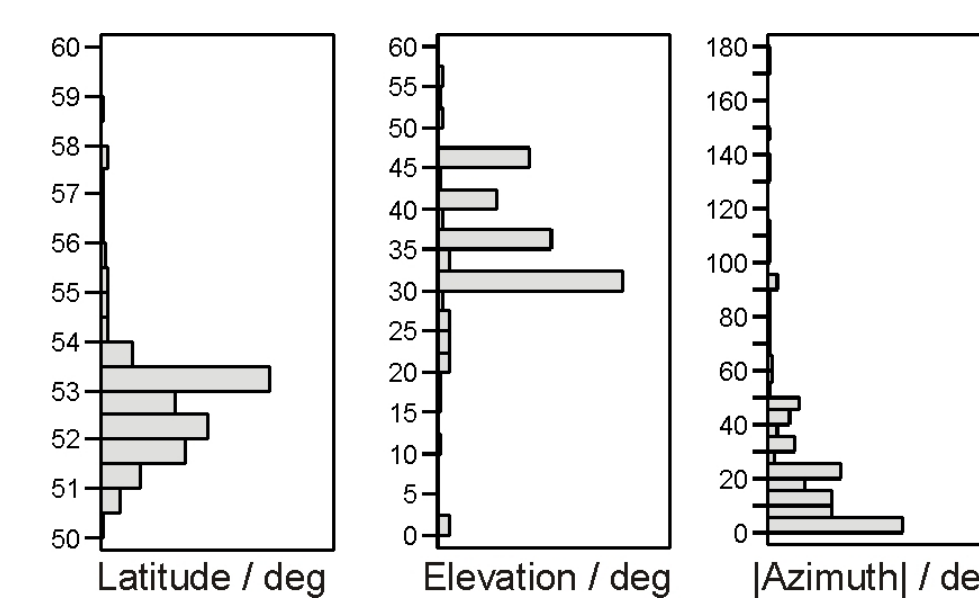
The Sheffield Solar Farm forms part of Project Sunshine, a University of Sheffield initiative to focus our science research on solving the increasing food and energy needs of the world's population. The Sheffield Solar Farm will help us determine how best to directly harness the power of the sun in the UK.

Funded primarily by the Higher Education Innovation Fund, to promote knowledge transfer and new links between industry, society and academia, the Farm will allow real world testing of photovoltaics. Along with a 70m² silicon photovoltaic solar panel installation, and a test bed to compare new and existing photovoltaic technologies, we will collect data from across the UK, from microgenerators who chose to share their data and experience with us. Our goal is to link laboratory testing to field application. Data will be collected, analysed and distributed to researchers, installers, policy makers and the public.

A factorial analysis

1. Monthly solar energy yield is fitted with a regression model
2. Elevation, Azimuth and Latitude are regression factors
3. Monthly efficiency and energy yield (kWh/m²) are modelled
4. Efficiency is the energy yield / horizontal irradiance
5. Yearly yield can be predicted by summing the monthly model

Distribution of regression factors for the experimental installations



Efficiency increases in the winter, for most rooftop installations, because in the winter the sun path is at 90° to the elevation of the solar panels. In addition solar panels generate higher voltages and higher energy yield at lower temperatures

Efficiency is independent of latitude. Energy yield reduces with latitude - there is less irradiance further north. Both Efficiency and energy yield are relatively insensitive to azimuth and elevation within the range of experimental rooftop installations. However - it's clearly a bad idea to have north facing solar panels.

Solar energy peaks in May and June. In the winter there is only 10% the yield present in the summer. On some days yield can be close to zero. Increasing day length, more sunshine hours and less atmospheric absorption of the sunlight due to higher sun path all contribute to the summer yield.

Yearly energy yield prediction

1. Monthly solar energy yields are summed to give yearly totals - where less than yearly data is available the monthly regression model is used to extrapolate along with monthly solar irradiance
2. Elevation, Azimuth and Latitude are regression factors for the yearly model
3. Experimental regression data is compared with the standard Assessment Protocol (SAP) for PV installs

