



The University of Sheffield.

The Sheffield Solar Farm UK Solar Irradiation in 2011

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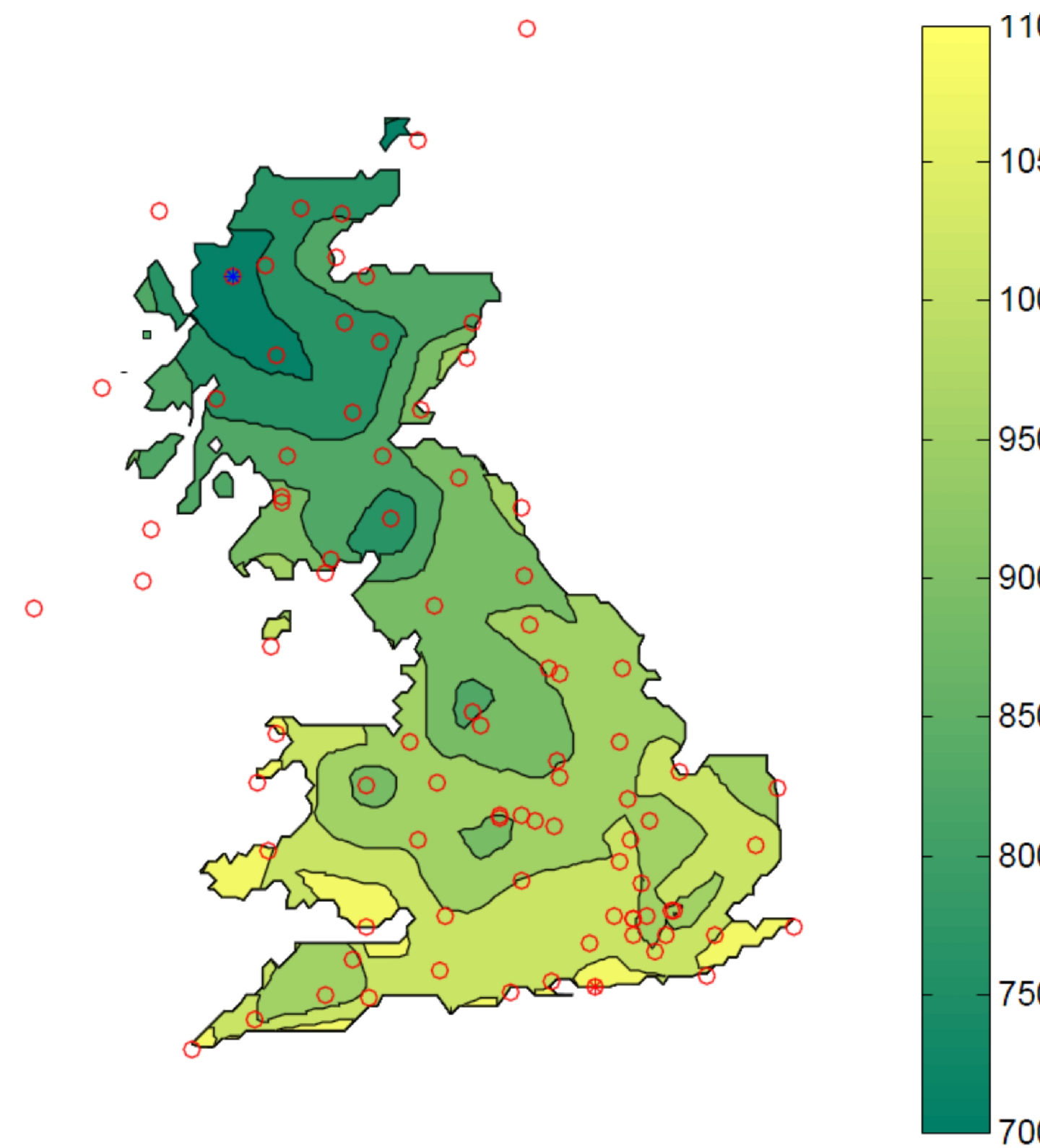


Global Horizontal Solar Irradiance in 2011

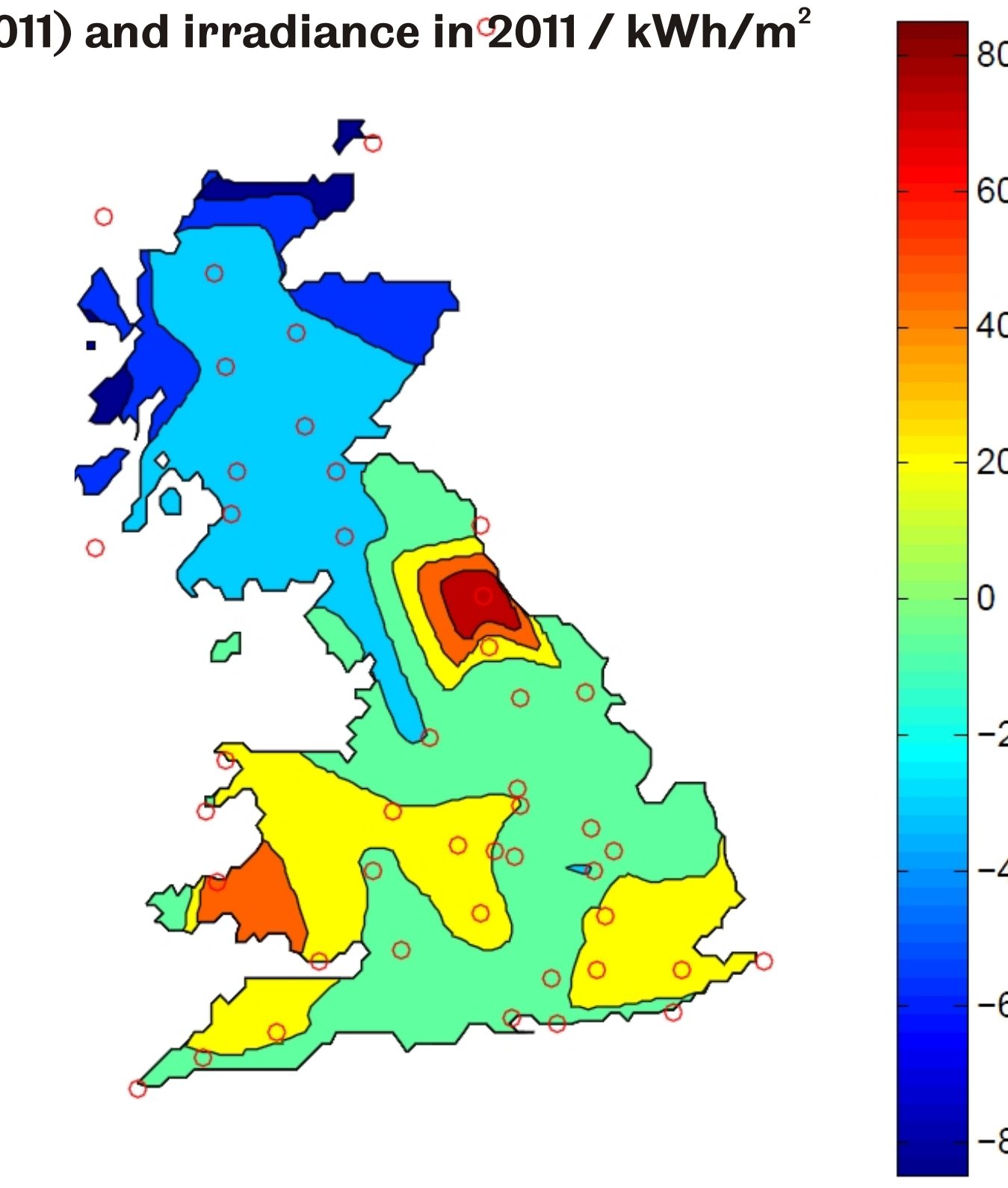
UK Total solar irradiation map (January - November) in 2011 / kWh/m²

2011 irradiation kWh/m² and difference from historical average

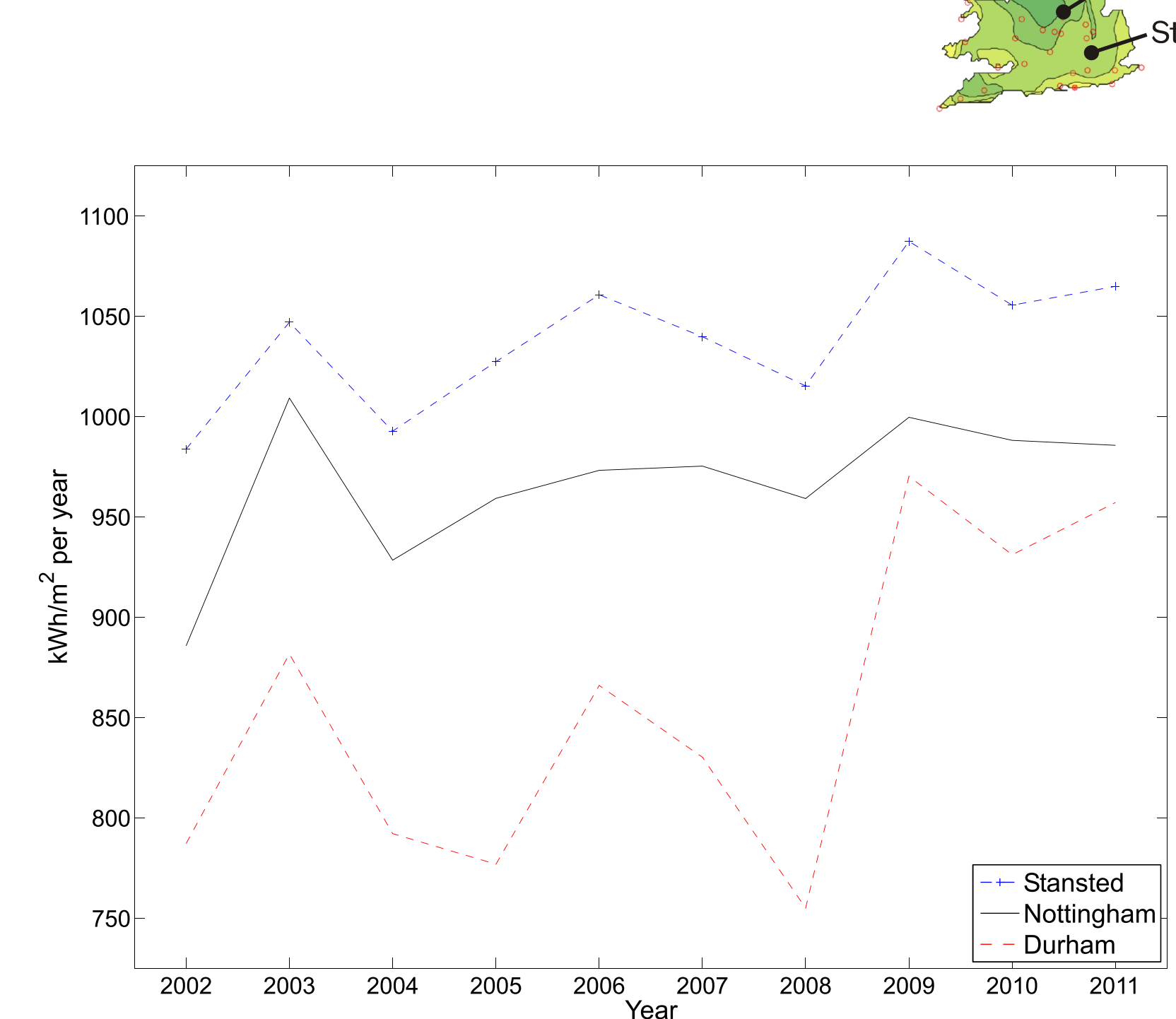
Plymouth	1144	+0.1%
Cardiff	1171	+4.2%
Stansted	1065	+3.0%
Nottingham	986	+2.2%
Manchester	913	-0.7%
Durham	957	+13.5%
Edinburgh	913	-1.2%
Orkney Islands	772	-10.8%



Difference between average historical irradiance (2002 - 2011) and irradiance in 2011 / kWh/m²



Yearly global irradiance from 2002 - 2011 for three UK locations / kWh/m²



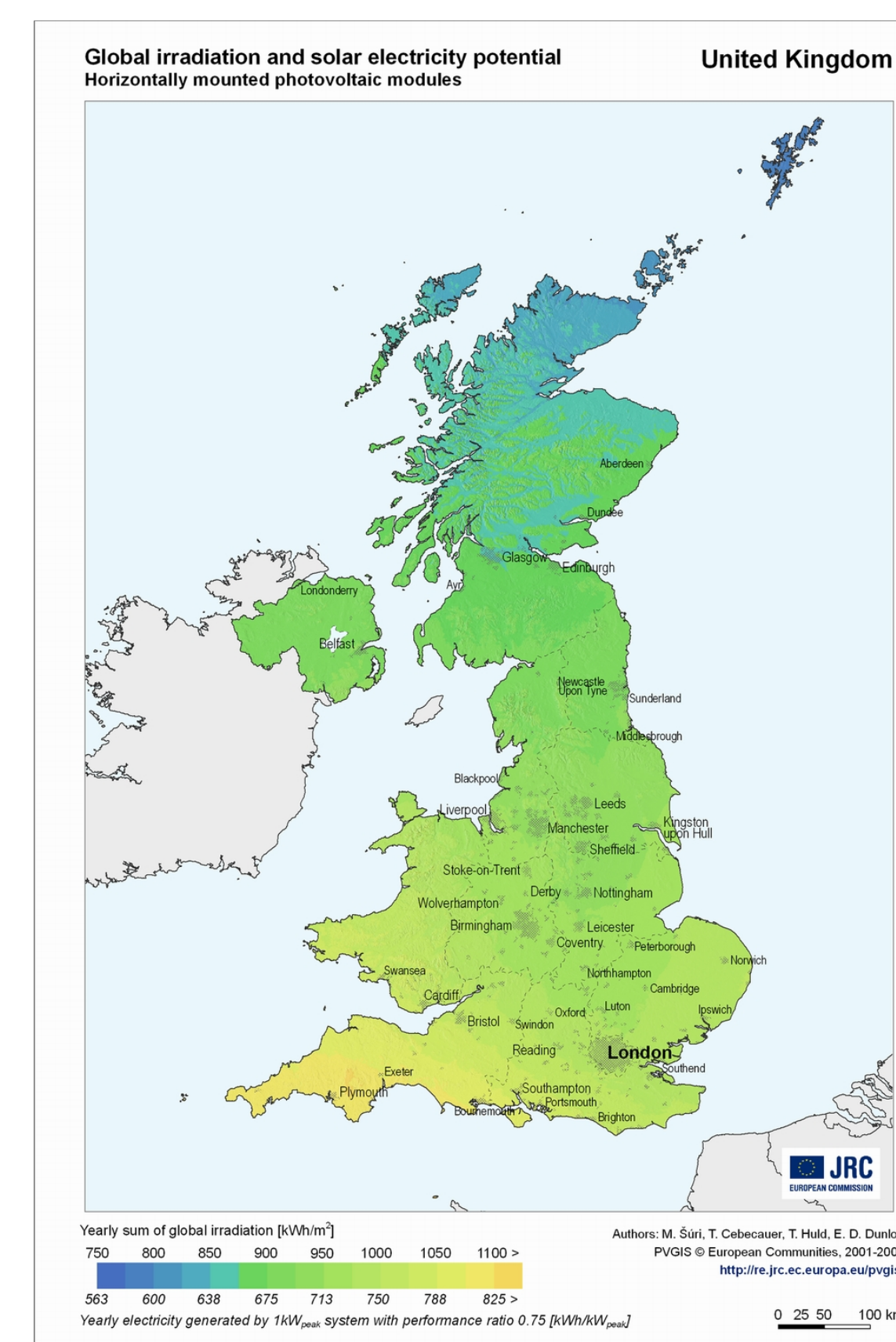
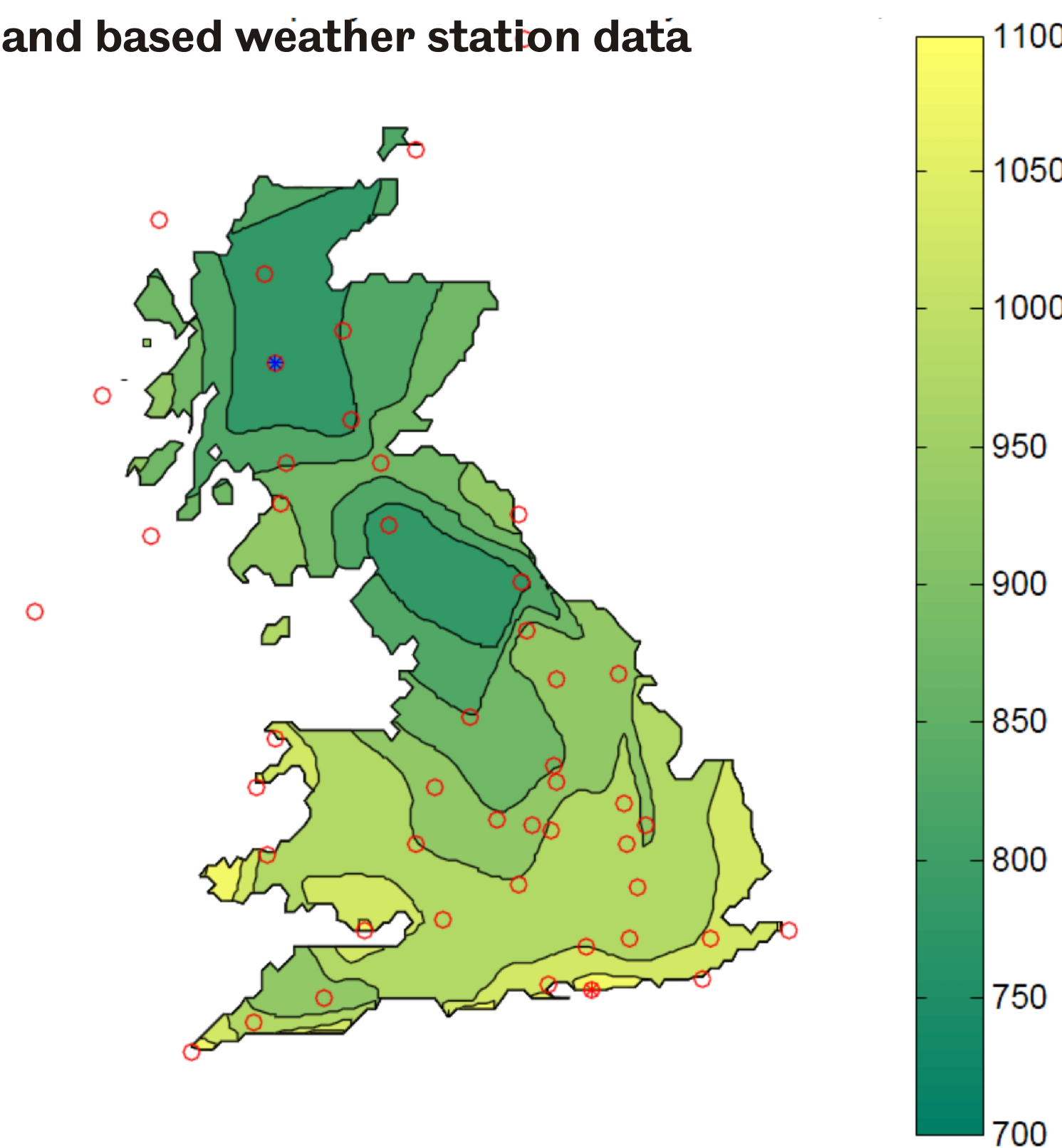
www.sheffield.ac.uk/solarfarm

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 choose 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.

Historical Solar Irradiance Maps

Average solar irradiance between 2002 - 2011 / kWh/m²
MIDAS land based weather station data



Conclusions

- Maximum year to year variation in irradiation is > 10%
- Typical year to year variation is < 5%
- There is a gradual yearly trend for increasing irradiation
- Approximately a 5% increase from 2002 - 2011
- Centre of UK (Sheffield) yields around 950 kWh/m²
- UK range is +/- 20 % from this central value
- Much of southern and central England and South Wales has similar yearly irradiance of between 1000 - 1100 kWh/m²
- The highest irradiance in 2011 was shared between South Wales and the central and west English south coast.



We gratefully acknowledge academic access to the Met office MIDAS land surface station meteorological database and irradiation data available online via PVGIS <http://re.jrc.ec.europa.eu/pvgis/index.htm>. All figures and graphs are derived from data available via MIDAS, PVGIS and instrumentation located at the Hicks Building