MEASURING THE DYNAMIC RESPONSE OF SOLAR PANELS

Unlike traditional contact transducer measurement techniques, the measurement of solar panel dynamics with a scanning vibrometer from Warsash Scientific is a non-destructive, non-contact, remote method that allows a highly precise calculation of mechanical properties and can be used to predict service times for newly designed materials.

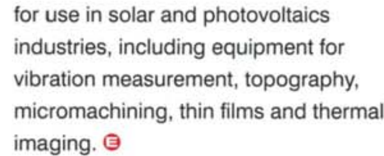
Computer modelling and simulation can help to determine load/strain scenarios and processes for materials and parts prior to actual deployment. In this way, they can be further developed and improved based on the results and customised to their future applications and environments. Combining simulated results with real experimental data allows a highly precise calculation of mechanical properties and can be used to predict service times for newly designed materials.

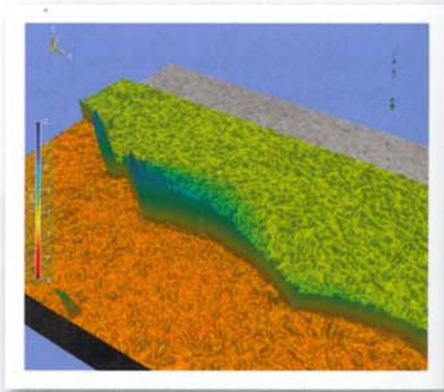
Researchers at the Fraunhofer Center for Silicon Photovoltaics CSP in Halle, Germany, investigate the mechanical vibrations on solar panels. Using this data, they are able to engineer appropriate design improvements to achieve the best possible stability and service time.

Unlike traditional contact transducer measurement techniques, the scanning vibrometer measurement of solar panel dynamic properties is a non-destructive, non-contact, remote method that enables the determination of resonance frequencies, operational deflection shapes as well as material parameters like stiffness and damping without mass loading.

Operational deflection shapes (ODS) for resonance frequencies can be compared to the respective simulation results. The frequencies and shapes confirm the basic simulation model that has been used. To optimise mechanical strength, thus increasing the service time, variable parameters such as panel dimensions or mounting/installation techniques can be confidently simulated, measured, and adjusted to match the expected application.

Warsash Scientific offer instrumentation for use in solar and photovoltaics industries, including equipment for vibration measurement, topography, micromachining, thin films and thermal imaging.





2012, "Measuring the Dynamic Response of Solar Panels", *Energy Source & Distribution*, Mar | Apr 2012, page 86.