

# Validation and implementation of a viscoelastic material model for analysis of an instrumented photovoltaic module mechanical test

Matt R. Phillips<sup>1,2</sup>, James Y. Hartley<sup>2</sup>, Ashley M. Maes<sup>2</sup>, Charles D. Robinson<sup>2</sup>

September 30, 2021

<sup>1</sup> North Carolina State University

<sup>2</sup> Sandia National Laboratories

Energy Research: Spark Talks, North Carolina State University



# Goal & Instrumentation

What's the problem?



Rahmatmand et al. Solar Energy, Volume 171, 2018

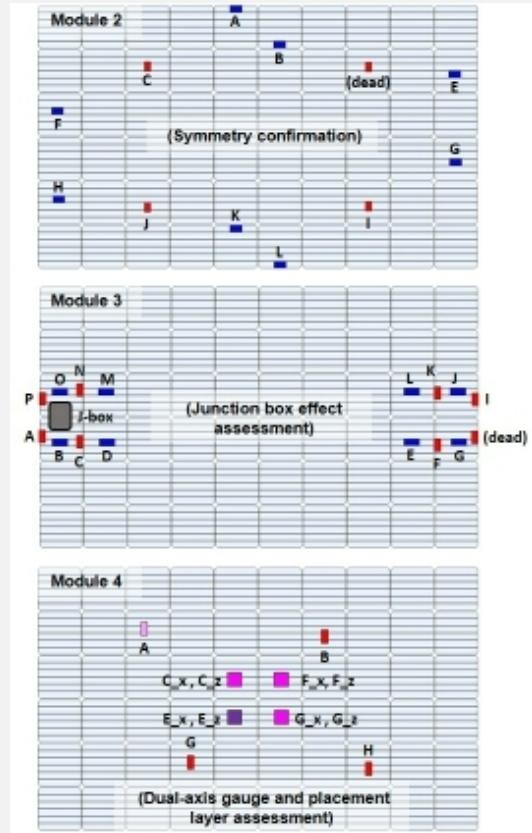
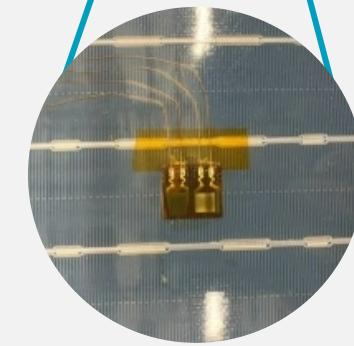
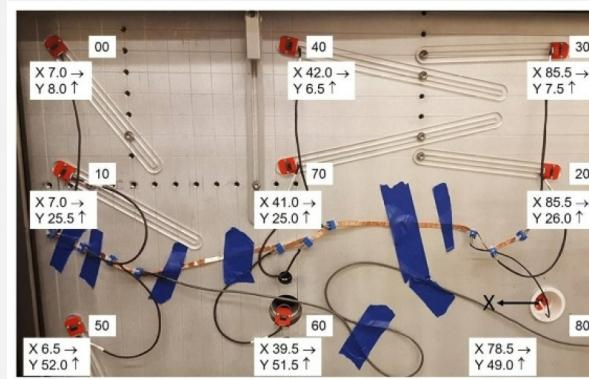
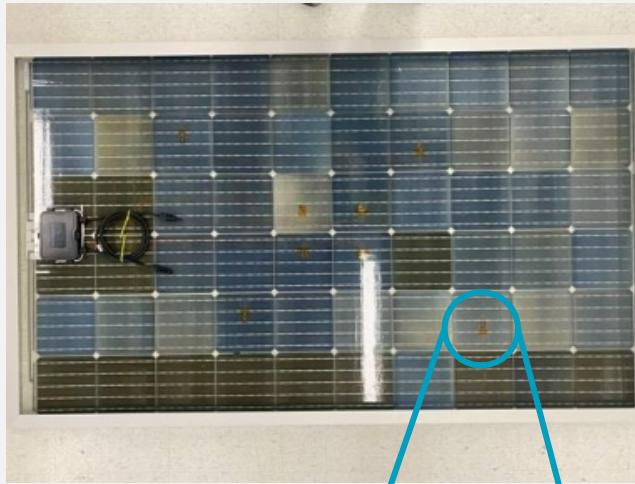


Win Win Precision Technology Co., Ltd.



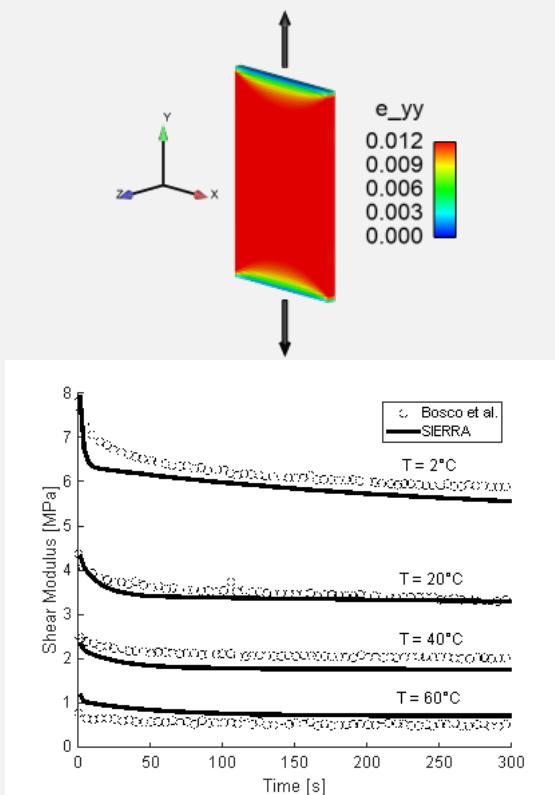
<https://youtube/-qdyxlybmoc>

What can we do?



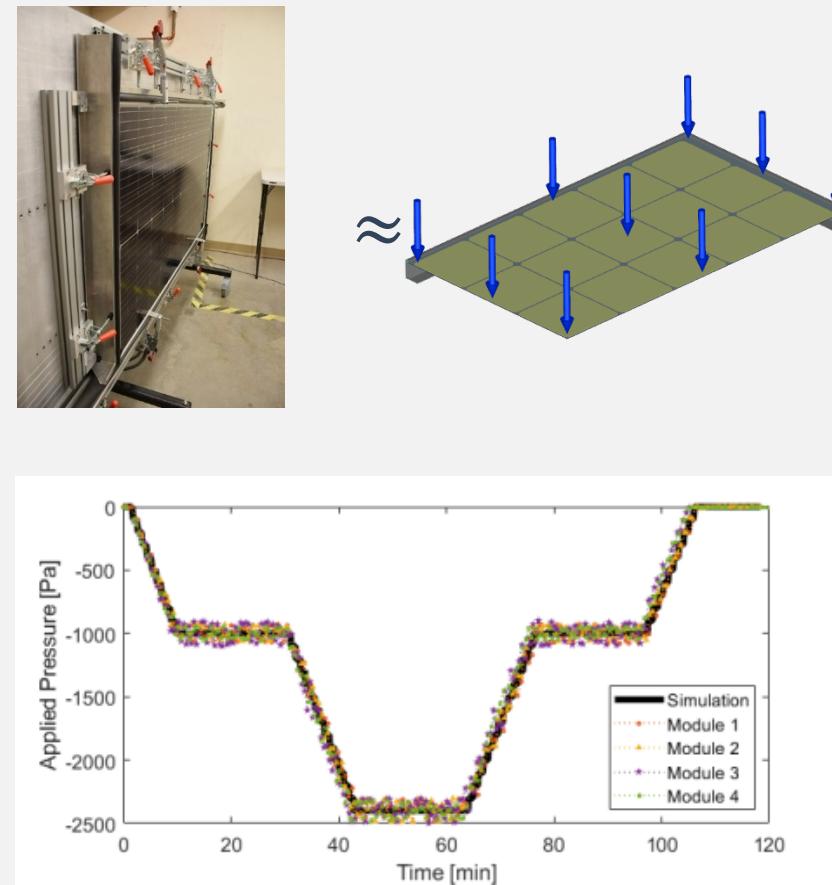
# Simulation & Results

## Viscoelastic Material Model Validation



Bosco et al. IEEE Journal of Photovoltaics,  
VOL. 10, NO. 5, 2020

## Applied Pressure Boundary Condition



## Displacement and Strain Results

