U.S. Department of Energy
HelioCon
Heliostat Consortium for
Concentrating Solar-Thermal Power

Heliostat Consortium Seminar Series

Brought to you by the Resource, Training, and Education (RTE) topic area

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Host: Dr. Brooke Stanislawski

Title: Wind Driven Loads on Solar Collectors: Perspectives from Two Field Campaigns

When: Sept. 18th
1-2 PM MT

Zoom:
https://nrel.zoomgov.com/j/1615841404?pwd=cb1p3zyu1WTpLoCZbUOduam5RTRYi5.1

Abstract:

Optical performance of solar collectors is known to be sensitive to wind driven loads. This performance loss is typically quantified in the form of tracking and slope errors. Tracking error is defined as the angular offset of a collector away from the sun position whereas slope error is due to the deformation in the shape of the collectors' mirror surfaces. Previous studies have explored the impact of tracking error on optical performance but have not fully addressed the impact of wind-driven loads on the tracking error. Further, there is a lack of long-term data characterizing spatial and temporal variations in tracking errors at an operational power plant. In this presentation, we will characterize tracking errors on parabolic troughs at the Nevada Solar One CSP plant and on heliostats at the Crescent Dunes power tower plant. This characterization of optical performance loss is generated using long-term field measurement of the collector orientation (elevation and azimuth) at multiple locations across the power plant.

Bio:

Shashank Yellapantula is a scientist in Computational Science at the National Renewable Energy Laboratory in Golden, Colorado. Shashank holds a doctorate in mechanical engineering from Stanford University. Prior to his time at NREL, he worked at GE Global Research as a research engineer. At NREL, Shashank leads a number of projects involving renewable energy involving wind, solar and biofuels. Recently, he has been working on characterizing impact of wind on optical performance of collectors used in Concentrated Solar Thermal Power.