



TECHNOLOGY READINESS LEVEL: 4

US PATENT PENDING

KEY ELEMENTS HAVE BEEN INTEGRATED WITH SUPPORTING ELEMENTS FOR TESTING.

TECHNOLOGY SUMMARY

The Theoretical Overlay Photographic Heliostat Alignment Technique (TOPHAT) is a unique method which helps to accurately and effectively concentrate solar energy onto a receiver. By utilizing a camera/target fixture placed in front of the heliostat TOPHAT aligns and focuses the mirrors on a heliostat. It uses the photographs taken by cameras on the fixture and comparing the location and size of the target patterns with their predicted theoretical images. Adjustments are made to the facets until the photographic images of the targets match the theoretical images in location and size. The fixture is a flat structure nominally the same dimensions as the heliostat.



Cameras are accurately mounted at the center and corners of the fixture. Targets, also mounted on the fixture, are viewed by the cameras in reflection through the facets.

Sandia also holds a similar technology— TOPCAT™— for trough applications.

POTENTIAL APPLICATIONS

- Energy Sustainability
- Solar Concentration
- Power Production
- Fuel & Chemical Production

TECHNOLOGICAL BENEFITS

- Increased efficiency & accuracy in solar mirror alignment
- Reduced loss of concentrated solar
- Can be used during heliostat assembly or within heliostat field
- Cameras can work during the day or at night

TECHNOLOGY INQUIRY?

For more information or licensing opportunities contact us at

ip@sandia.gov

Refer to SD # 11596

or visit

<https://ip.sandia.gov>