

Developing a New Computationally Efficient Method for Optimal Design of the Heliostat

Field for a Solar Power Tower Plant

Student Researchers:

- o Saeb Besarati (Team Leader)—College of Engineering—Chemical & Biomedical Engineering
- o Amin Ahmadi Adl—College of Engineering—Computer Science & Engineering
- o Hady Ahmady Phoulady—College of Arts and Sciences— Mathematics & Statistics
- o Ahmad Khayat Jafari—College of Arts and Sciences—Physics

Abstract

Solar power tower technology is one of the leading candidates for sustainable power production; however, it is still not economically competitive with coal-generated electricity because of the high capital costs. A direct reduction of the cost can be achieved by optimal design of the heliostat field because it typically accounts for 50% of the total cost and 40% of energy losses. On the other hand, optimal design of the field is computationally intensive and requires a large number of calculations. A four person team from USF Engineering and Arts and Sciences will investigate the possible ways to develop a computationally efficient method for designing the heliostat field. This is an interdisciplinary task which requires knowledge from principles of solar energy, optics, geometry, and computer science. By the end of the project, the group will demonstrate the software and design a sample heliostat field for a location in United States.