	CPV	**Fraunhofer ISE** **CPV outdoor**
Location of the infrastructure :	Freiburg, Germany	
Contact person :	Gerald Siefer	Phone : +49-761-4588-5433 E-mail : gerald.siefer@ise.fraunhofer.de

Objectives :

- IV measurements of CPV modules at the outdoor test field of Fraunhofer ISE

Main features :

1. Long term measurements / monitoring
   Several CPV modules can be monitored continuously with the outdoor measurement set-up at Fraunhofer ISE. It consists of a high precision two axis tracking and data acquisition unit. A full IV curve is measured at least every 10 minutes. Besides the pure IV data all relevant meteorological data is recorded, as direct normal irradiance, global normal and fixed irradiance, wind speed, ambient temperature, pressure and relative humidity. Besides these “standard parameters” also the reading of a set of a Ga0.5In0.5P, Ga0.99In0.01As Ge isotype/component cells is recorded, as parameterization of the direct normal sun spectrum. Additionally a sunphotometer is operated, that monitors the sun’s direct spectral irradiance at 7 different wavelengths.

2. Short term measurement campaigns
   Besides the long term monitoring, also special measurement campaigns can be performed, like angular dependence measurements or determination of optical efficiency of single concentrator optic units.

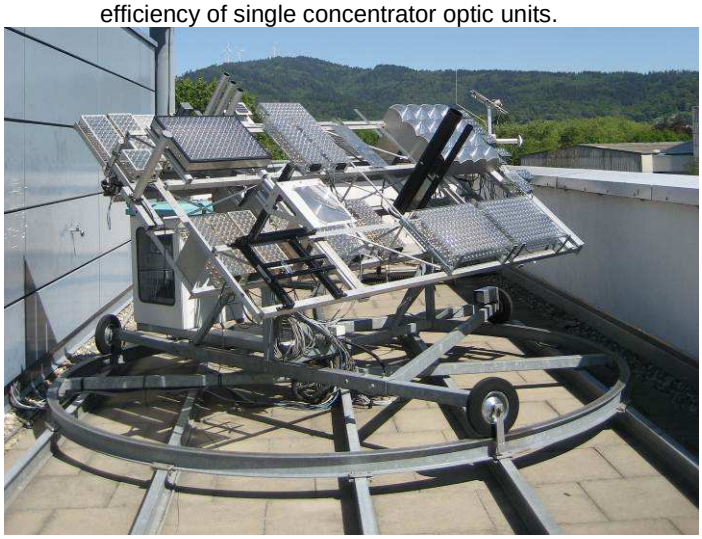

Figure 1: Outdoor test set-up on the roof of Fraunhofer ISE with several CPV modules monitored continuously.

Limitations or constraints :

The access will be allowed with technical and scientific assistance from Fraunhofer ISE.

Typical services or results :

Monitoring of CPV module performance together with meteorological parameters
Determination of angular acceptance of CPV modules
Outdoor optical efficiency measurements

Support can be provided in respect to the data analysis.

Examples of research projects :

- Determination of correlation of CPV module performance with meteorological parameters
- Comparison of outdoor measurements with indoor results.