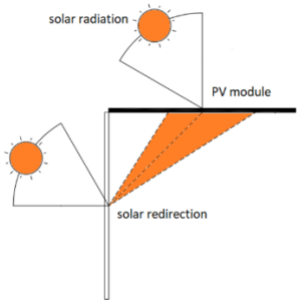
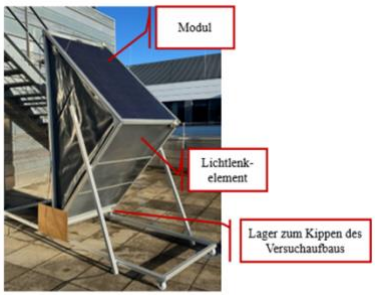
Bifacial Photovoltaics with Solar Concentration

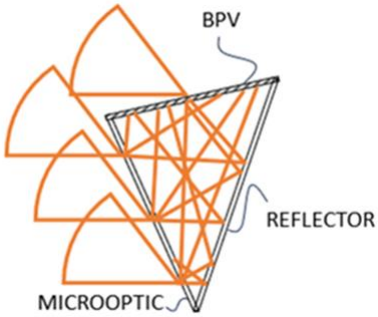
Today most solar cells are bifacial: they can produce electrical energy from both front and rear side. They allow additional gains of 5% to 30% by diffuse and reflected radiation on the rear side without considerable extra charges. A significant increase of bifacial gains can be achieved by a concentrating system without solar tracking, we develop. Measurements of a prototype with micro-optical redirection of radiation show bifacial gains of 60%. Further developments with scientific and industrial partners aim at a simplified construction with increased bifaciality and reduced costs compared to conventional modules.



Principle solution with micro-optical redirection of solar radiation



Prototype for measurements at ZEIS, HS-Düsseldorf



Integrated solution with reflector

Link: Helmut F.O. Müller: Passive Redirection of Solar Radiation by Micro Optics to Increase the Bifacial Gain of Photovoltaics.
Proceedings of: World Renewable Energy Congress – 23, 12-15 January – 2025, Bahrain.