

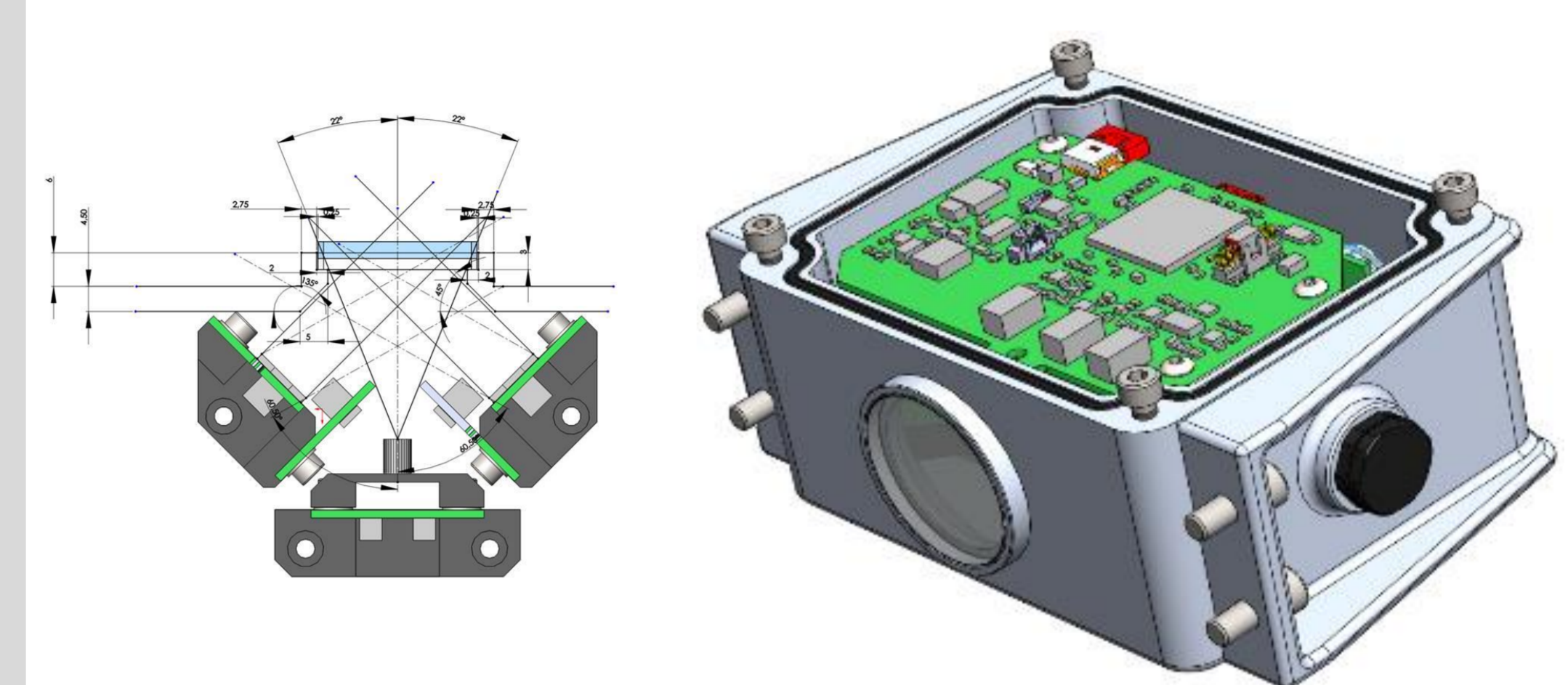
Scattering sensor embedded in mirrors for continuous soiling monitoring of CSP plants

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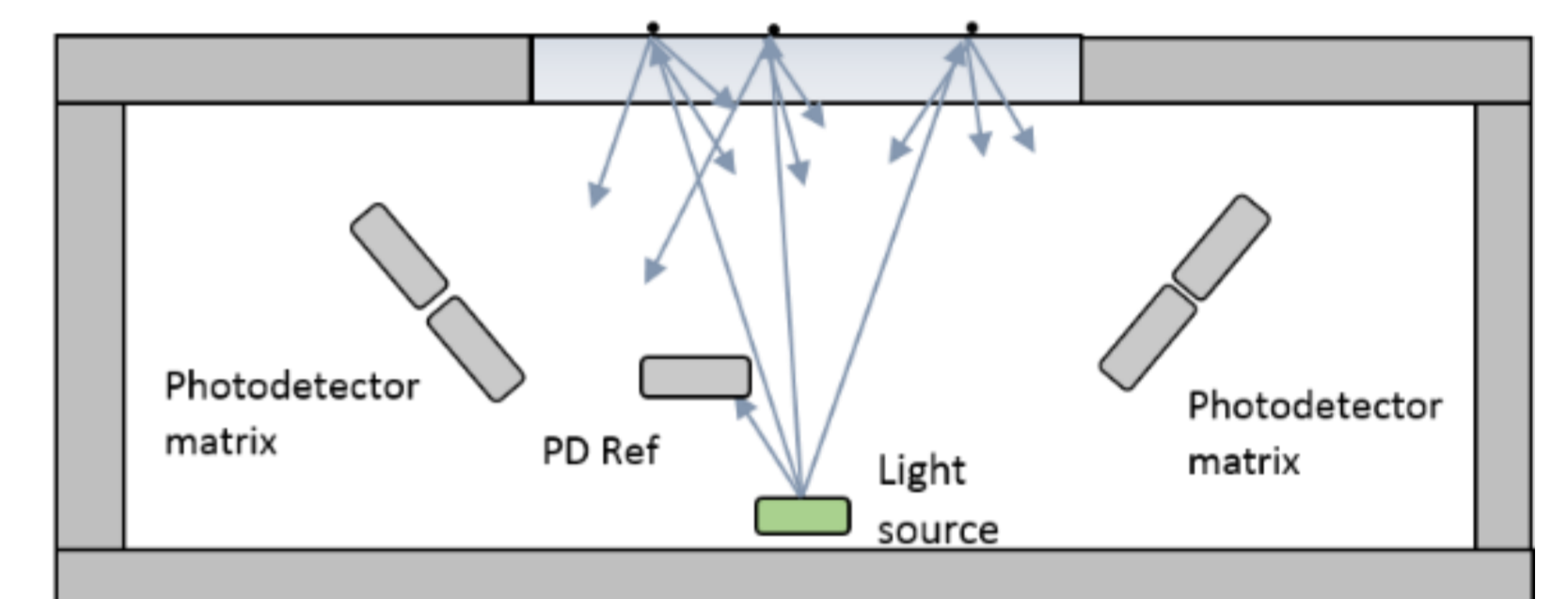
SENSOR CONCEPT

- On-line measurement of the soiling level in parabolic trough mirrors in CSP plants for the optimization of the cleaning processes
- Correlation between soiling measurements and the associated reflectance loss
- Direct integration into mirrors
- Low-cost sensor solution



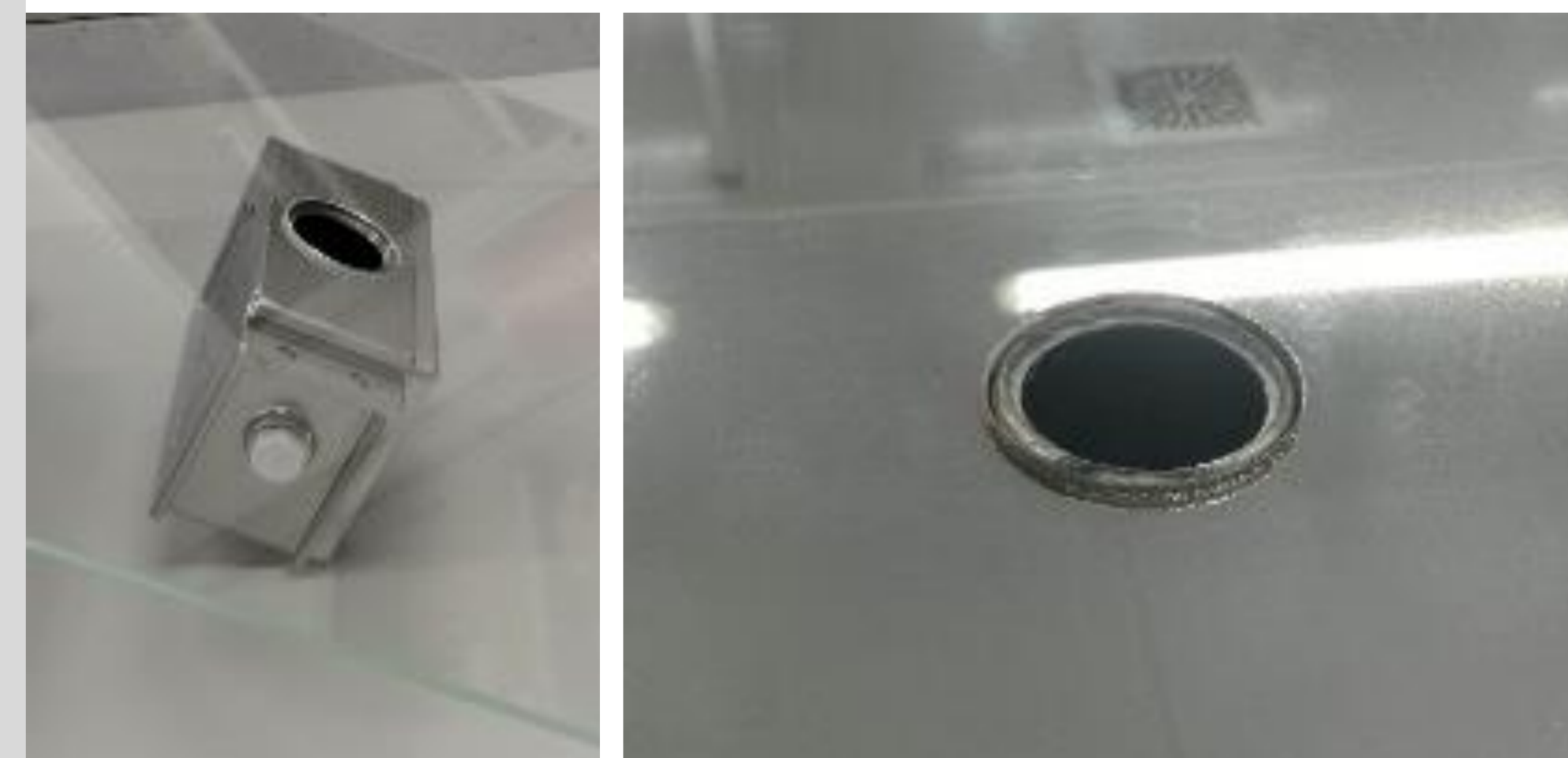
MEASURING PRINCIPLE

- Infrared light scattering
- Projection of a controlled infrared light beam under the soiling on the sensitive substrate
- The light scattered by the soiling particles is measured through several photodetectors



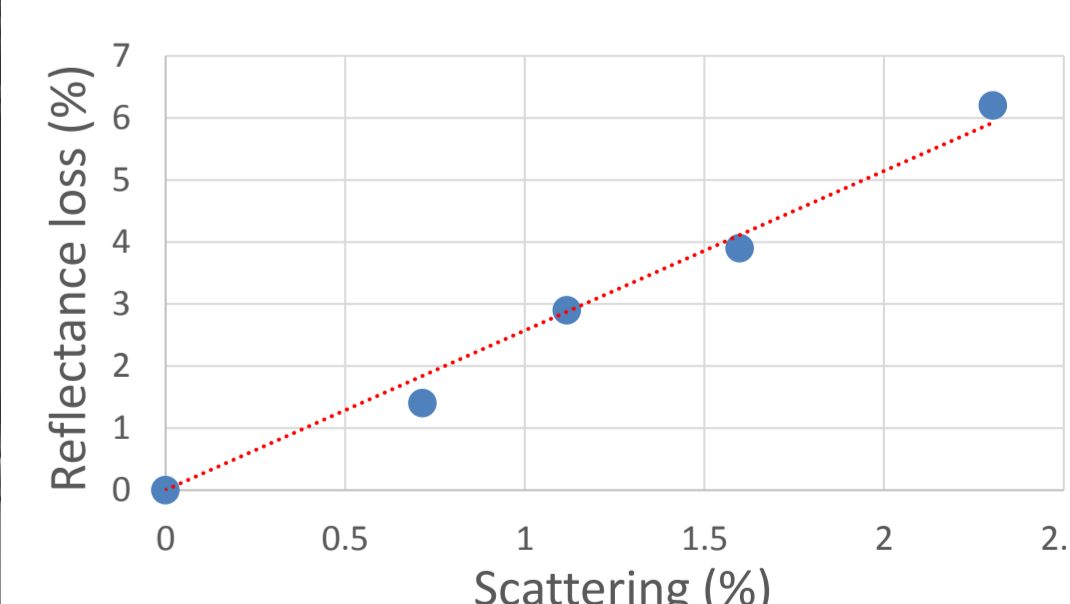
SMART MIRROR CONCEPT [1]

- Sensor integrated within the mirror surface, with its sensitive surface coplanar to the mirror
- Optimized measuring point for mirror-like soiling exposure
- Easy installation and deployment



PRE-VALIDATION AT LABORATORY SCALE

- 30 prototypes have been manufactured, calibrated and tested in laboratory conditions
- Good correlation between scattering and actual reflectance measurements under controlled soiling deposition conditions



VALIDATION AT SITE

- 30 prototypes will be installed and tested at La Africana PTC Solar Power Plant in real working conditions within SOLWARIS EU Project scope



SOLWARIS

[1] Related SolarPACES 2020 poster: "SMARTMIRROR®: Making CSP plants smarter and more profitable"