

# Performance evaluation of the small-size HELLAS heliostat

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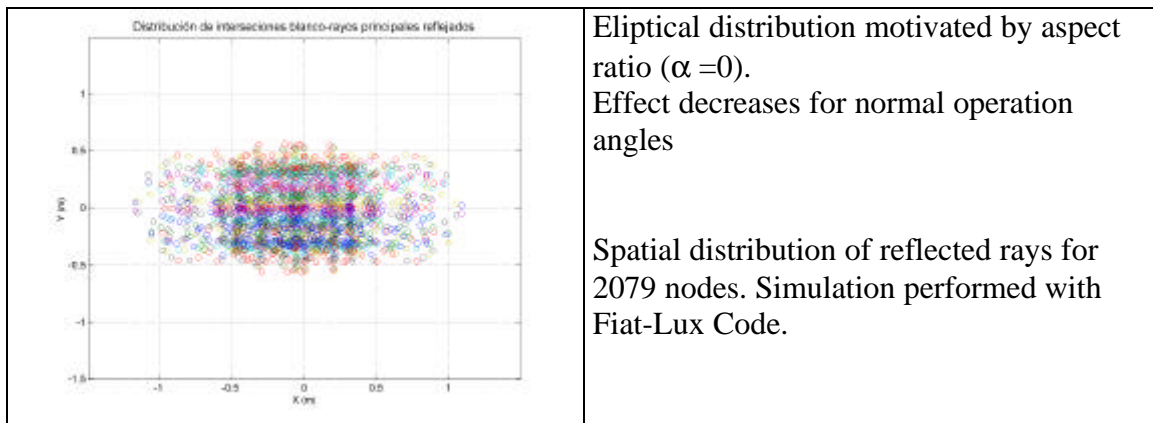
A new type of reduced-dimension, low cost heliostat, has been jointly developed and tested by GHERSA and CIEMAT at the Plataforma Solar de Almeria facilities in South Spain. Design and development criteria were basically oriented to simplicity and modularity:

- ♣ Target installed cost of \$150/m<sup>2</sup> (40 % less than state-of-the-art large-area heliostats).
- ♣ Light and modular structure allowing easy transportation and minimizing on-site assembling.
- ♣ Autonomous operation with communication by radio-modem.
- ♣ Easy installation and canting, and small size (19.2 m<sup>2</sup>).



**Area: 3,2 x 6 m (19.2 m<sup>2</sup>)**  
**Aspect Ratio = 1.88**  
**Number of facets: 3**  
**Facet dimensions: 2 x 3.2 (6.4 m<sup>2</sup>)**  
**Pedestal size: 1.9 m high**  
**Weight: 31 kg/m<sup>2</sup>**  
**Fresh reflectivity: 93 %**  
**Drives: Linear actuators**  
**Beam quality: 2.4 mrad**

The heliostat consists of 3 facets as shown in the picture, and its most relevant innovations, apart from its small size, lie in the type of actuators used and the control system. The paper will describe the configuration of the heliostat and characterization results regarding optical and operational performance. A comparison analysis using DELSOL of different heliostat fields between 1 and 50 MW, reveals that the small size and aspect ratio (1.88) of the HELLAS heliostat reduces up to 7 % the mirror area required compared to large-size configurations between 70 and 150 m<sup>2</sup>.



The optimization of mirror area and the simultaneous low-cost projected make the HELLAS heliostat specially adequate for small-size power tower plants and for all plants requiring high peak fluxes onto the receiver.