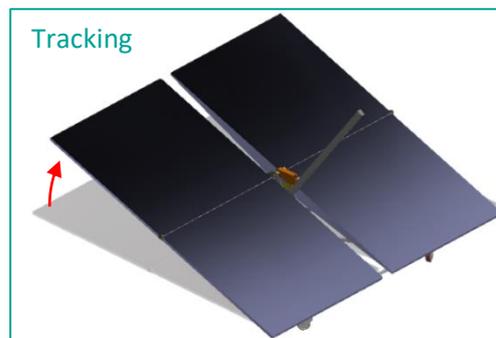
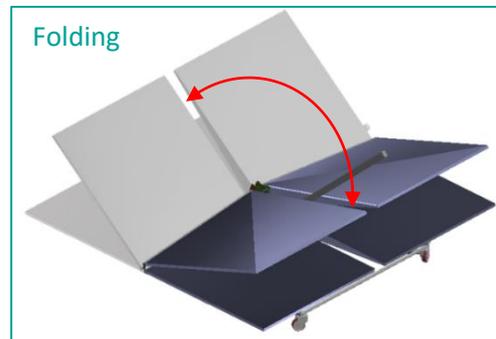


FLAP Heliostat

Heliostats are considered the most crucial components of **Concentrating Solar Power (CSP)** systems with central receiver. A novel heliostat, particularly designed for desert environments, called **FLAP**, was developed to decrease cost and increase service life.

BACKGROUND

Since CSP applications require direct sunlight, eminently suitable plant sites can be found in desert regions. However, dusty conditions can reduce the performance of the plant due to soiling of the heliostat's reflective surface. Furthermore, sand particles can cause irreversible damage of the mirror surfaces, e.g. reflectance loss. Also, pylon-based heliostats – which are currently state-of-the-Art – are generally prone to high wind loads during storms, thus impeding the deployment of lightweight support structures. All these short-comings can be tackled by employing the FLAP heliostat concept.



TECHNOLOGY

The essential innovation of FLAP is the foldable concentrator structure consisting of two panel sections that are oriented **Face-to-face** when being in **Lay-down** stow position. The concept hence implies an inherent **Anti-degradation Protection** of the reflective surfaces, i.e. soiling as well as sand abrasion can be substantially reduced. Wind loads are minimized due to the low profile of the heliostat structure in stow position.

Face-to-Face Lay-down Anti-degradation Protection

Folding of the panels is accomplished by means of a folding mechanism comprising a simple 4-bar-linkage. It is **actuated by the one single central linear actuator**, also used for elevation tracking in order to avoid costs for additional drives. The mechanism also includes a toggle lever solution for automatically locking the folding panels against undesired collapse during tracking operation. (Patent pending.) Preferably, the FLAP concept is merged with a low-cost azimuthal carousel wheel carriage.

ADVANTAGES

The FLAP heliostat is designed to substantially

- Reduce soiling of the mirror surface
- Reduce risk of sand abrasion of the mirror surface
- Reduce wind load on the heliostat structure during storms

Besides **lightweight design**, and hence, **lower material costs**, potential **savings in costs for O&M and cleaning water consumption** can thus be considered the most crucial benefits of the FLAP heliostat.

Ref.no.: E_867

KEYWORDS:

Heliostat, Face-to-Face concentrator, CSP, power tower, desert environment

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COOPERATION OPTIONS:

Research Cooperation,
Licensing, Sale

DEVELOPMENT STATUS:

Detailed concept

STATUS OF PATENTS:

European patent pending

CONCEPT ANIMATION:



<https://cloud.tugraz.at/index.php/s/Z9NmskD7NTBrPJ5>

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