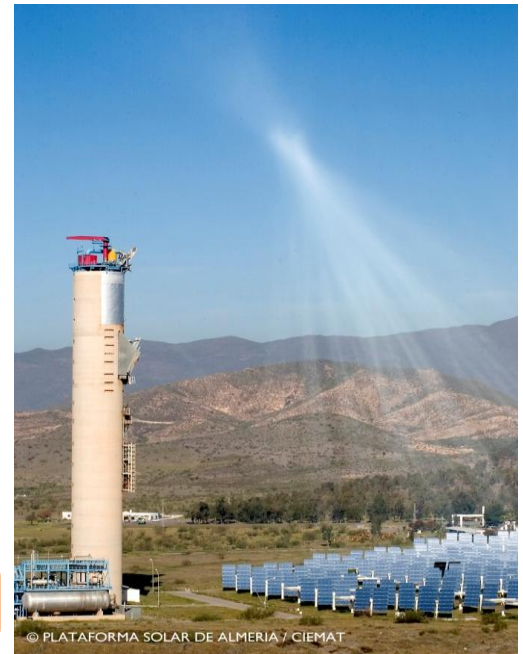


ATMOS

High-Accuracy Real-Time Monitoring of Atmospheric Attenuation in Solar Tower Plants

Patented technology for direct, spectrally resolved measurement of solar radiation losses between heliostat field and receiver.

TECHNOLOGY TRANSFER / LICENSING OPPORTUNITY FOR CHINA



In large tower plants, the atmosphere becomes part of the optical system.

Aerosols, dust and water vapour reduce the energy delivered to the receiver. The loss changes with site, weather, time of day and heliostat-to-receiver distance - creating performance uncertainty that standard models cannot fully capture.

Measured attenuation variability at approx. 1.3 km

~6% loss on clear days

lower turbidity; attenuation still relevant at long slant ranges

~20% loss on hazy days

aerosol and haze events can strongly reduce delivered receiver power

Why ATMOS is different

- Direct measurement of attenuation, not only assumed model parameters.
- Spectrally resolved monitoring across 350-1650 nm, including near infrared.
- High accuracy: <1% absolute attenuation measurement and +/-0.5% relative attenuation.
- Designed for commercial solar tower plants with long slant ranges and variable atmosphere.

350-1650 nm

spectral range

60-120 s

measurement time

<1%

absolute accuracy

PCT + CN

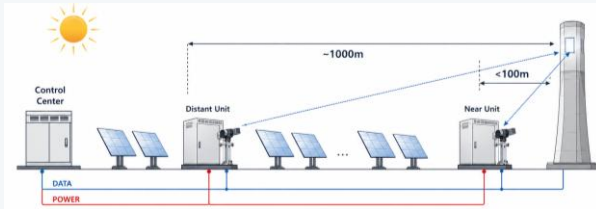
patent family

ATMOS Technology

FIELD-VALIDATED TECHNOLOGY READY FOR TRANSFER

From patented know-how to Chinese industrial deployment

How it works



ATMOS compares a reference spectral unit located close to the target with a main spectral unit at a longer distance. After calibration and background radiation correction, the spectral difference provides the atmospheric attenuation profile for the optical path.

Reference unit: <150 m from target | Main unit: >900 m recommended distance

Technical edge

Direct spectral attenuation measurement
350-1650 nm spectral range
60-120 s measurement time
<1% absolute attenuation accuracy
+/-0.5% relative accuracy

Applications

Plant design and optical modelling
Performance assessment and uncertainty reduction
Commissioning and acceptance tests
Real-time operation and monitoring
Atmospheric database generation

Current maturity

Field-validated patented technology, ready for transfer to an industrial partner for final product adaptation, industrialization and local deployment.

Protected IP

PCT publication: WO2020016466A1
Title: System for measuring in real time the atmospheric attenuation of electromagnetic radiation from at least one source and measurement method.
Publication date: 23 Jan 2020

China: CN111868516A / CN111868516B
Chinese publication date: 30 Oct 2020

Partnership model

CENER is seeking a Chinese industrial partner to license and complete the industrialization of ATMOS for local manufacturing, integration and commercial exploitation in China.

- CSP tower developers / owners
- Instrumentation or photonics companies
- Solar field, heliostat or EPC suppliers

Partner with CENER to deploy a patented European technology for reducing performance uncertainty in China's next generation of solar tower plants.