

ZEN

IMPROVED ZENITHAL RADIOMETER FOR

AOD DETECTION IN REAL TIME

- No moving parts
- Easy maintenance
- Robust design suitable for harsh environments
- Sun blocking device + blower add-ons
- Optional cardan mount (for ship on-board uses)
- More powerful SBC inside for real time data using LUT




Sieltec Canarias S.L.

INNOVATION REACHING THE SKY

The ZEN system comprises a new radiometer (ZEN-R41/ ZEN-R52) and a methodology for AOD retrieval (ZEN-LUT). ZEN-R41 has been designed to become a standalone integrated system without moving parts, making it a low-cost and a robust instrument with low maintenance, appropriate for deployment in remote and unpopulated desert areas, or places where the ice can block a tracker. The ZEN-LUT method is based on the comparison of the measured zenith sky radiance (ZSR) with a look-up table (LUT) of computed ZSRs.

The ZEN-R41 is a radiometer jointly developed by SIELTEC and IARC (Spain) and designed to obtain AOD from downwelling zenith sky radiation at different wavelengths. It incorporates collimating lenses and internal baffles to achieve a $\sim 3^\circ$ field of view. The measurements, made simultaneously in all channels, are amplified and processed. Inside the instrument there are sensors for internal humidity and temperature monitoring. ZEN-Rxx signals are temperature corrected, allowing the minimization of the temperature dependence of the silicon detectors.



The new methodology and obtained results have been published in Atmospheric Measurement Techniques (20 February 2017):



<https://www.atmos-meas-tech.net/10/565/2017/>

A new zenith-looking narrow-band radiometer-based system (ZEN) for dust aerosol optical depth monitoring

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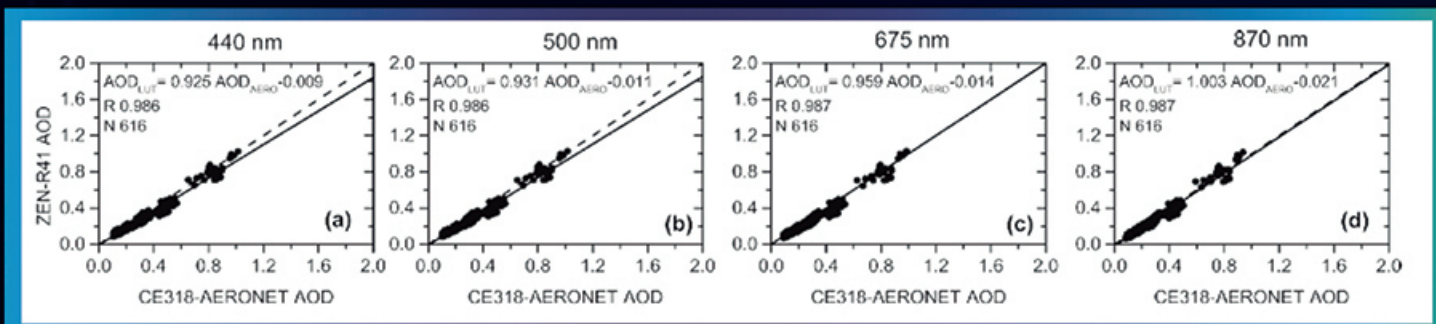
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AOD comparisons between CE318-AERONET and ZEN-R41 for four different spectral bands (440, 500, 675 and 870 nm) performed at Izaña station (IARC, Tenerife, SPAIN) in 2015

SPECIFICATIONS

Model	iZEN R-52
Sensors	Silicon diode
Number of channels	Up to 5
Wavelengths	440, 500, 675, 870 and 940 nm(*)
Field of view	2°
Measurement rate	1 minute
Resolution	16 bit
Stray light	Better Than 10^{-5} (**)
Dark noise	< 5 raw counts
Thermal noise (-15° to 50°)	< 5 raw counts (VIS), <40 raw counts (NIR)
Data output	<ul style="list-style-type: none"> • Raw counts on each channel • Standard deviation on each channel • Watt/m² on each channel • AOD on each wave length • Internal temperature • Internal humidity • Sun position data
Software	<ul style="list-style-type: none"> • Capture • Processing • Data graphs • Database • Export data • FTP backup • VPN access
Communications	Gigabit PoE LAN
Power supply	Input: 90 – 240V (***) Output: 15V, 25W PoE passive
Protection level	> IP67
Window	75mm diameter borosilicate window, 6.5mm thickness
Case	Top: anodized aluminium Body: powder coated aluminium
Internal extra heater	10W
Operating temperature	-40° to 55° (with internal extra heating)
Blower	Optional
Dimensions	170 mm height, 180 mm diameter
Weight	6 kgs (ZEN), 11.5kgs (total system packed)

(*) Others on demand
 (**) with the use of the Sun blocking add-on
 (***) Can be powered with solar panel



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