

# Cloud screening of desert site data using METRIC (Meris Extraction Tool for Indirect Radiometric Calibration)

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# What is METRIC ?

METRIC MERIS EXTRACTION TOOL FOR INDIRECT RADIOMETRIC CALIBRATION

Objective Extraction of filtered MERIS measurements acquired over natural sites (Rayleigh, Glitter, Desert, DC Cloud, Antarctic) for radiometric calibration

**New!**

**New!**

Input MERIS L1b RR

(+ optionally L2 breakpoint data obtained with ODESA)

Output spatially averaged normalised radiance or reflectance (all channels) + statistics and annotations

Operation embedded in the L1b processing chain or standalone from archived products

History developed for launch (2002), upgraded in 2011

# Selection of the MERIS data over desert sites

Criteria 1 – Site geographic limits (4 vertices polygon in {lon,lat})

Criteria 2 – Use of L1 Quality Indicator (saturation)

**Criteria 3 – Threshold on Reflectance at 443 nm**

- » Cloud screening based on high reflectance of cloud at 443 nm
- » Limited efficiency due to fixed threshold (not geometry dependent, not site dependent)

**Criteria 4 – Threshold on spectral index between 443 and 865 nm**

- » Objective: Cloud screening based on whiteness

**Criteria 5 – BRIGHT mask (from MERIS L1b flags)**

- » RT based geometry dependent threshold at 443
- » Applied only to NON WHITE desert sites – i.e. not applied to Lybia4

**Criteria 6 – Threshold on local variance at 490 nm**

- » identification of high short-scale variability (cloud/soil, cloud shadow, cloud contours)
- » Applied only to HOMOGENEOUS desert sites (→ applied to Libya4)

Cloud screening

**New!**

**New!**

# Selection of the MERIS data over desert sites

## Final selection:

- » Pixels must satisfy all criteria
- » More than 90% of the site's area is selected

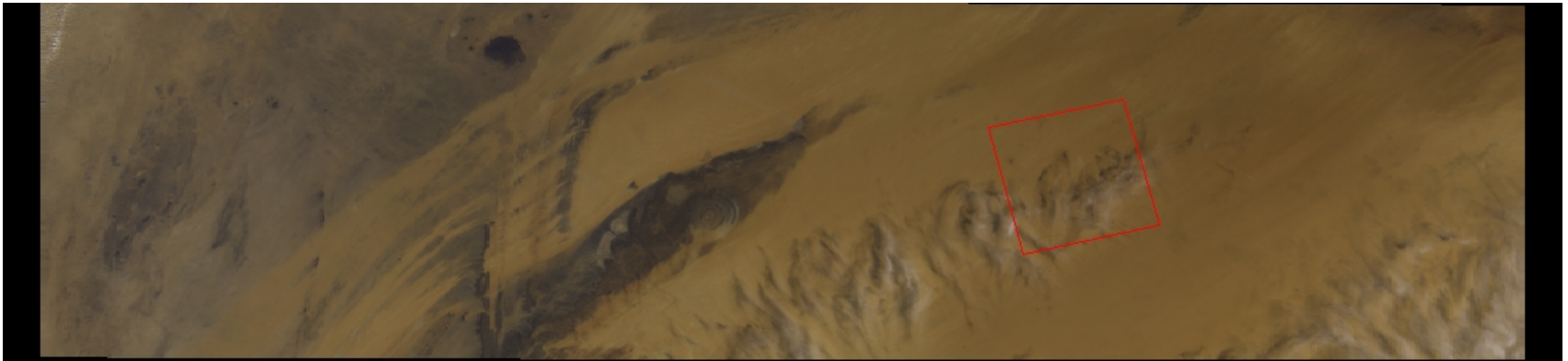
## Output

- » Reflectance: average and standard deviation (all bands)
- » Annotations (at site centre):
  - Geographic co-ordinates
  - Product co-ordinates (and source product references)
  - Sun and View angles
  - Sensor cell reference (camera and spatial detector indices)
  - Meteo: horizontal wind vector, sea level pressure, total column ozone, relative humidity

## Example of criteria

Mauritania2 (as no images available for Libya4)

RGB



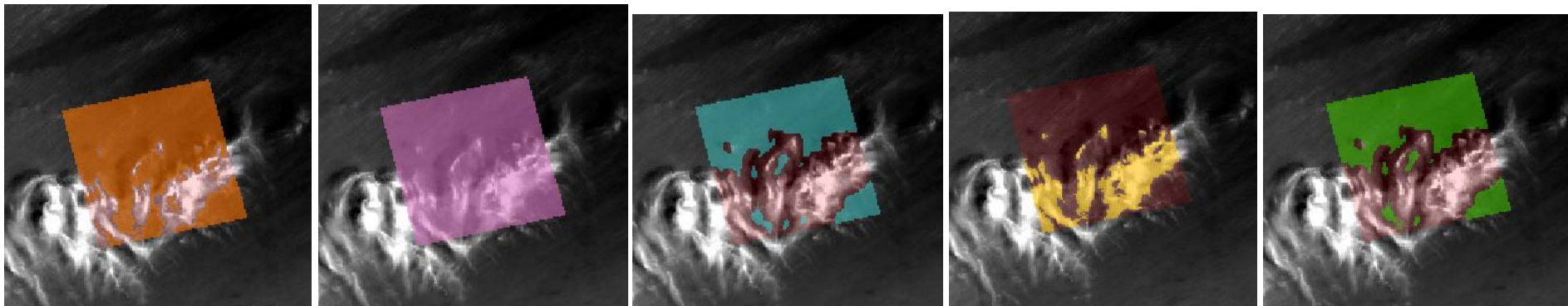
$\rho_{443}$

spectral index

variability

bright mask

Final

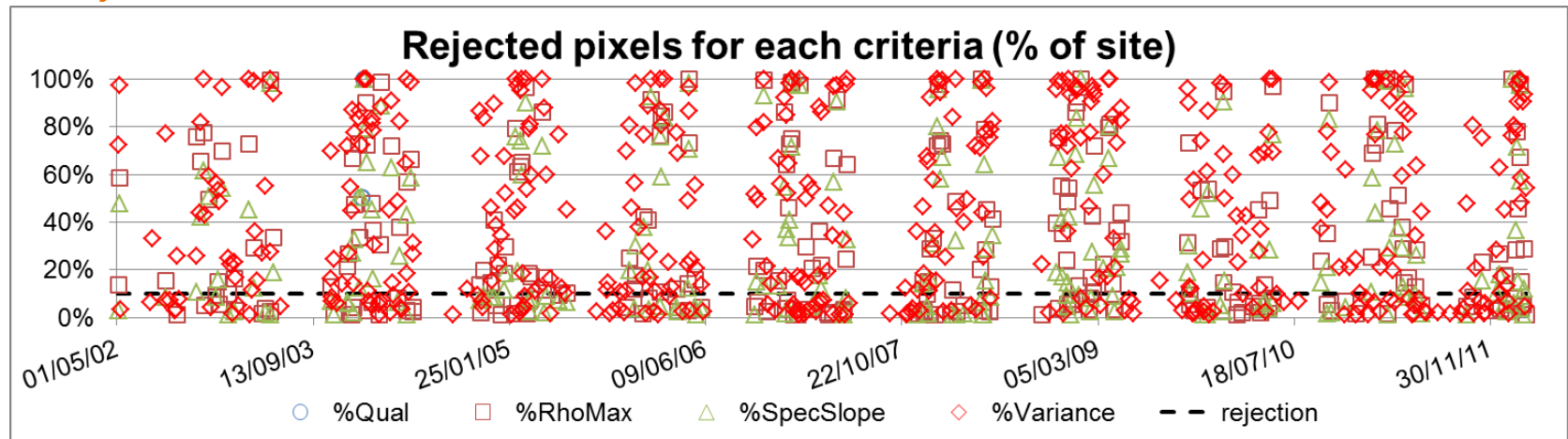


# Extraction statistics for Libya4

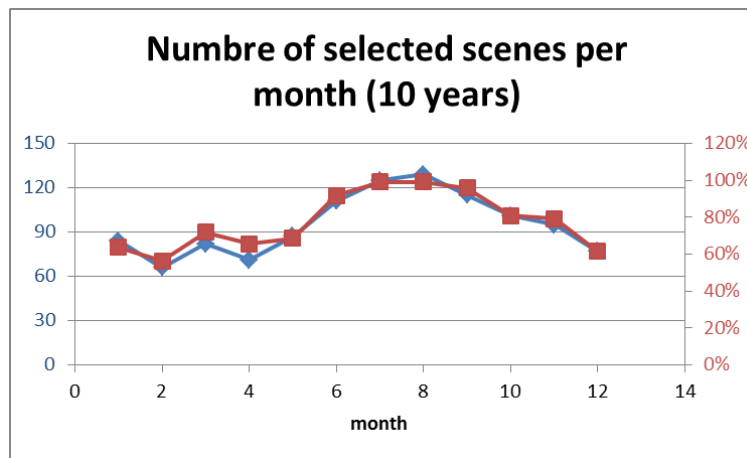
10 years mission coverage (05/02, 03/12):

1650 overflights → 1465 full coverage → 1143 results (322 rejected, 22%)

- Rejection time series:

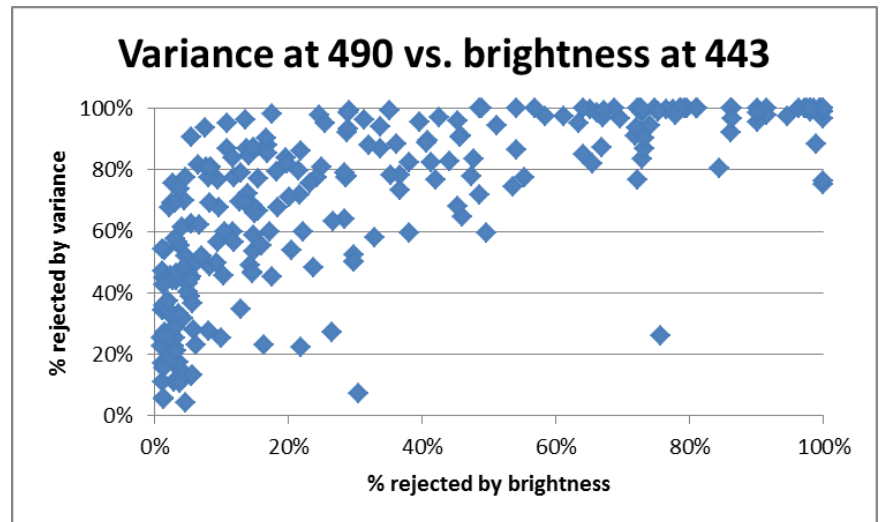
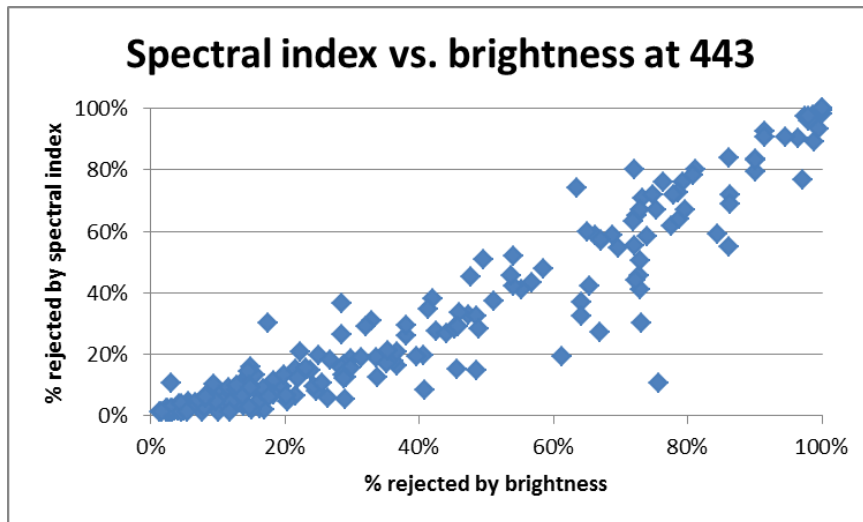


- Overall scene selection statistics:



## Extraction statistics for Libya4

Rejection time series suggest strong correlations between the 3 used criteria.



If spectral index and brightness are indeed correlated, local variability is largely independent bringing in new information.