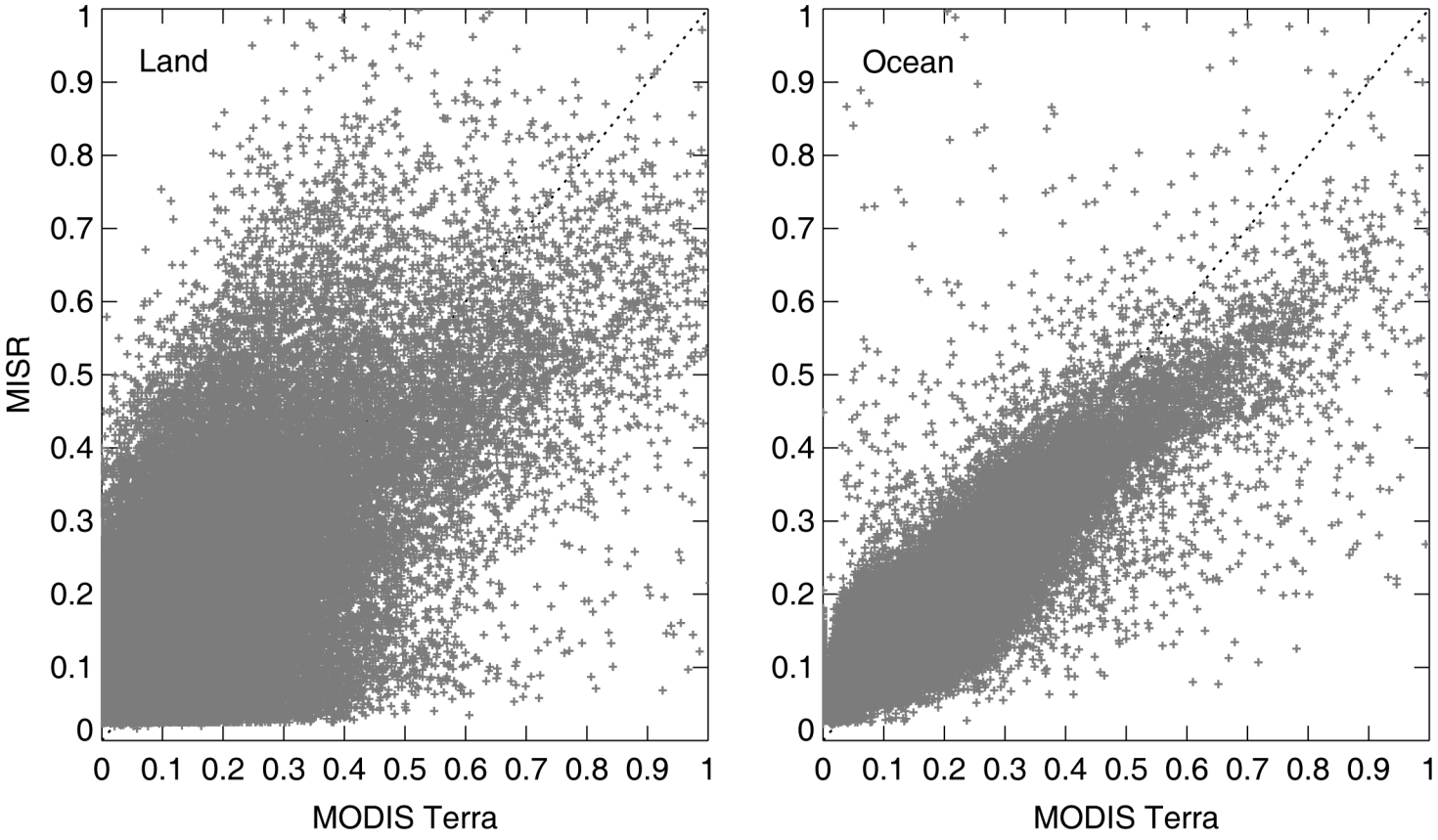

Land
Ocean
MISR
MODIS Terra
MODIS Terra
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Over ocean

$$\frac{|AOT_{MODIS} - AOT_{MISR}|}{\max(|AOT_{MODIS}|, |AOT_{MISR}|)} < 0.1 \qquad (A)$$

$$|AOT_{MODIS} - AOT_{MISR}| < 0.03 \qquad (B)$$

(A): 28%

(B): 57%

(A) Or (B): 57%

Over land

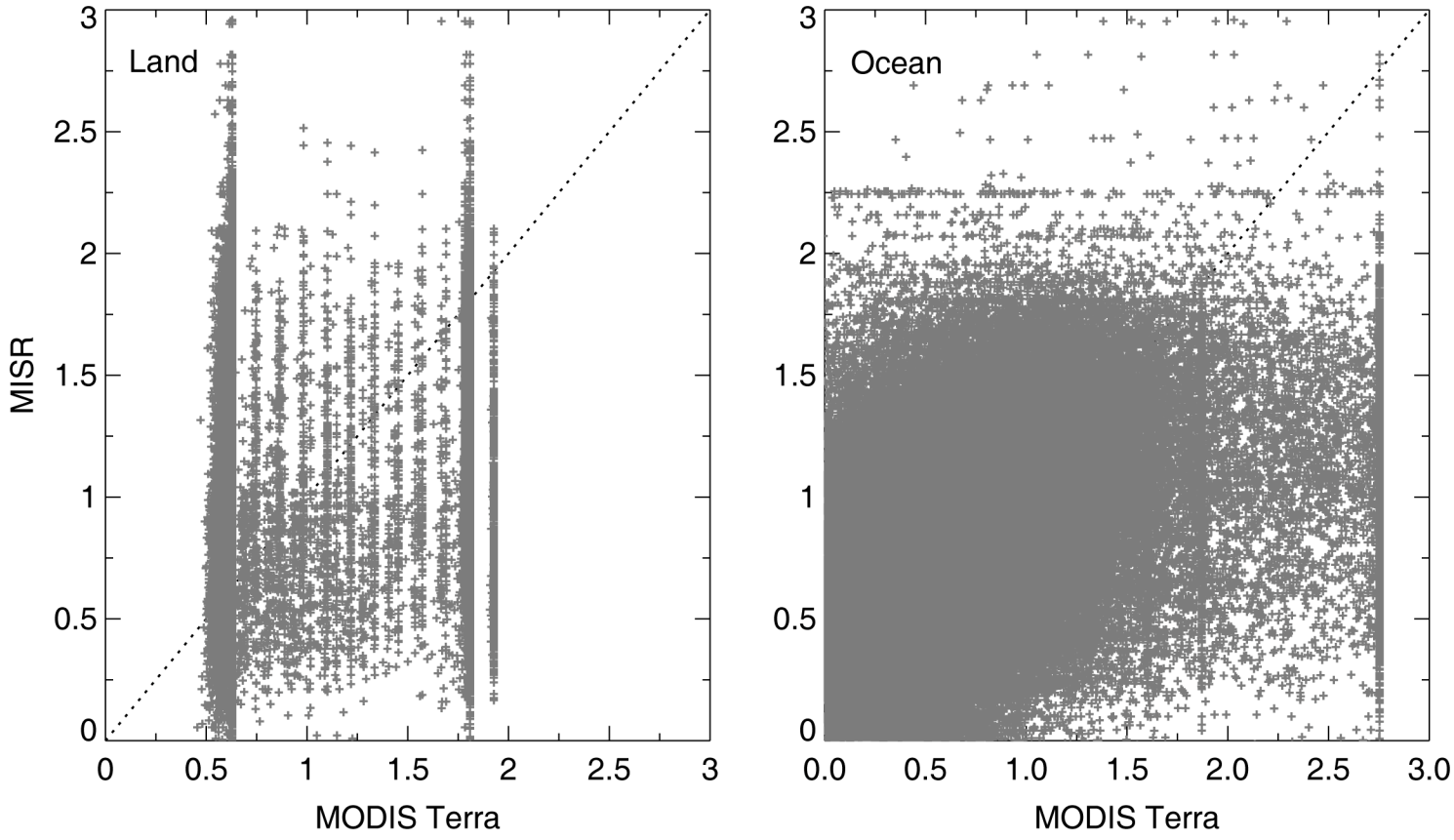
$$\frac{|AOT_{MODIS} - AOT_{MISR}|}{\max(|AOT_{MODIS}|, |AOT_{MISR}|)} < 0.15 \qquad (A)$$

$$|AOT_{MODIS} - AOT_{MISR}| < 0.05 \qquad (B)$$

(A): 12%

(B): 28%

(A) Or (B): 29%


Land
Ocean
MISR
MODIS Terra
MODIS Terra
0
0.5
1
1.5
2
2.5
3
0.0
1.0
2.0
3.0

Science objectives

1. Global distribution of aerosol properties
2. Aerosol effect on radiation budget
3. Effect of aerosols on clouds and precipitation

Retrieval requirements

Aerosol retrievals

- Spectral optical thickness (±0.02)
- Effective radius (±10%)
- Effective variance (±50%)
- Spectral behavior of the aerosol refractive index (±0.02)
- Particle shape
- Single-scattering albedo (±0.03)

For two aerosol components

Cloud retrievals

- Optical thickness (±8%)
- Effective radius (±10%)
- Effective variance (±50%)
- Cloud phase/particle shape

Precise polarimetry (~0.002):	particle size distribution, refractive index, and shape
Wide scattering angle range (i + p):	particle size distribution, refractive index, and shape
Multiple (v15) angles (i + p):	(i) cloud particle size via rainbow angle (ii) particle size, refractive index, and shape (iii) ocean surface roughness (iv) aerosol retrievals in cloud-contaminated pixels
Wide spectral range (i + p):	(i) separation of submicron and supermicron particles (ii) spectral refractive index $\Rightarrow$ chemical composition
1370 nm (i + p):	characterization of thin cirrus clouds
2200 nm (p):	(i) characterization of the land surface contribution at visible wavelengths (ii) cloud particle sizing
910 nm:	column water vapor amount