Combined Retrieval from Ground Based and Space-borne Measurements: New Possibilities for Surface Validation and Beyond

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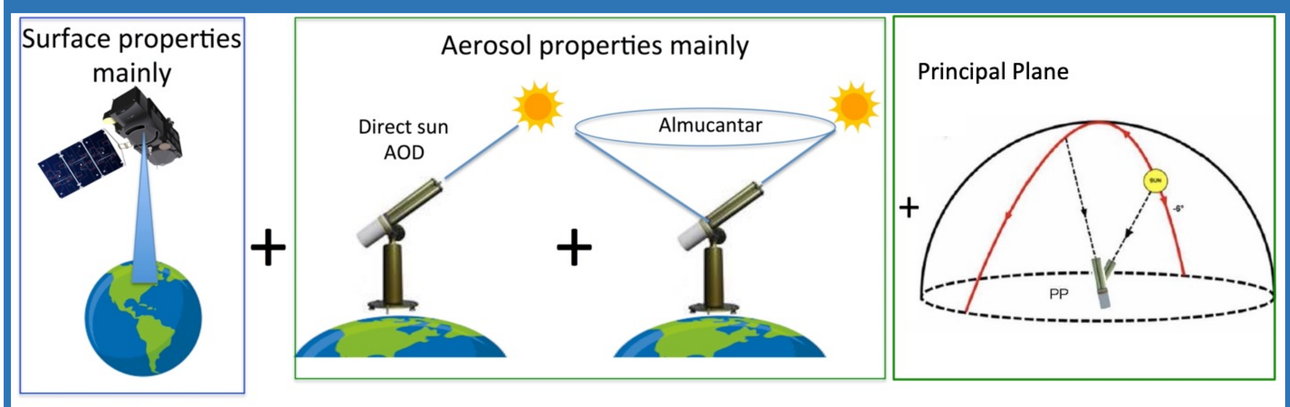
1. Concept of Synergetic Retrieval from Satellite and Ground Based Measurements



Input:

1. Nearest AERONET TOD (direct sun) + Almucantar (or Combined Almucantar and Principal plane) measurements
2. **Satellite measurements**

Conditions:

1. Reasonable fit of measurements (less than radiometric error)
2. Good correspondence of the retrieved aerosol properties with AERONET
3. Instrument is well calibrated.

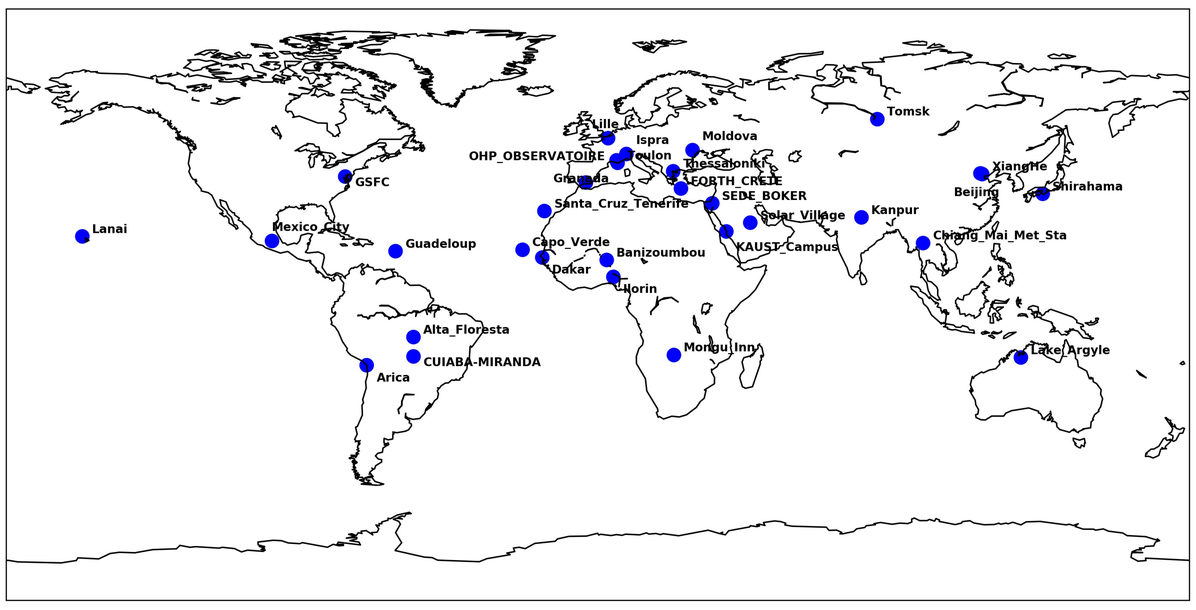
New possibilities:

1. Surface products of high quality
2. Robust system for surface reference dataset over AERONET stations
3. System for aerosol and surface model developments and testing

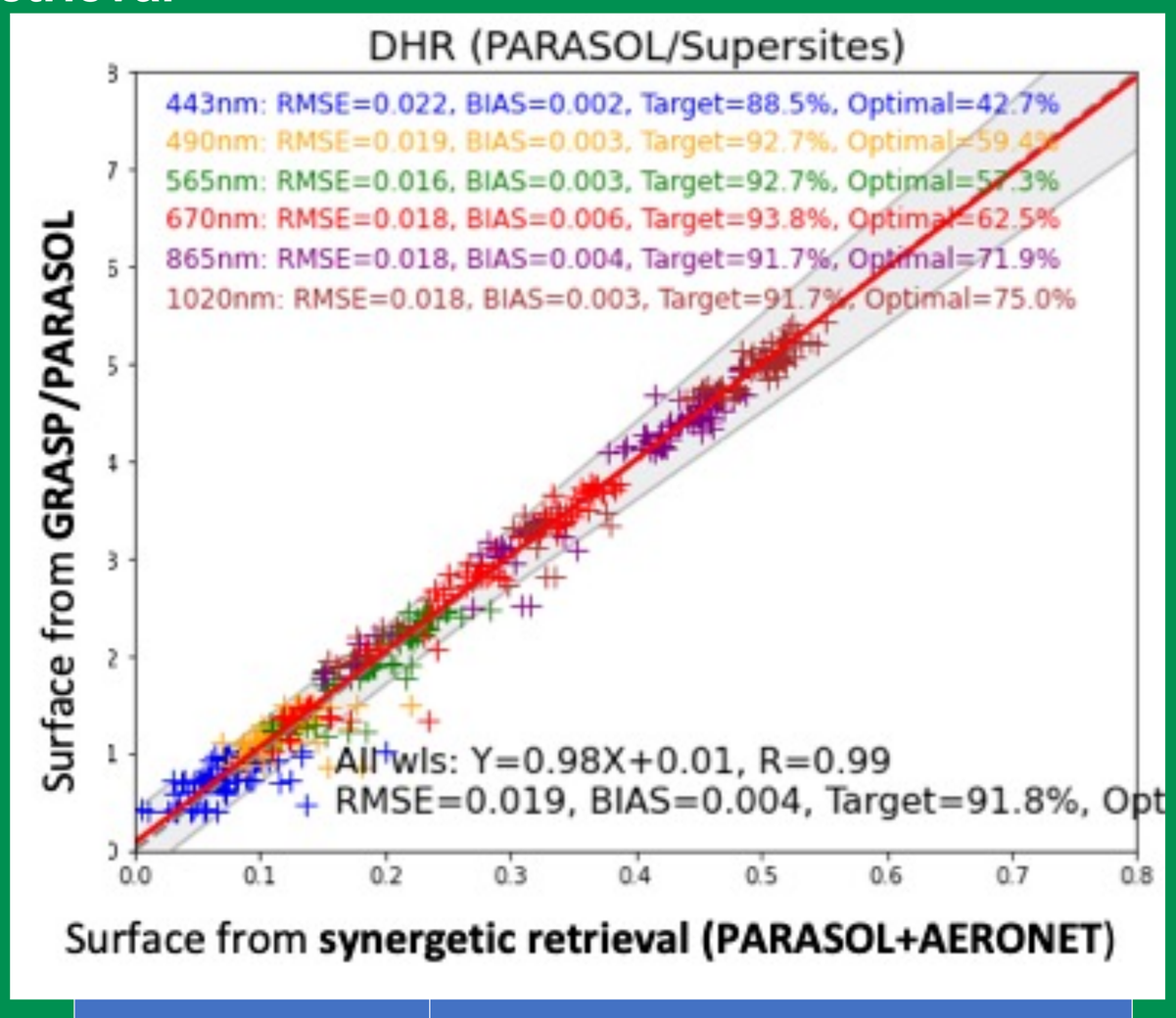
2. ESA GROSAT project: surface reference dataset Selected satellites

Satellite	Resolution	Product
S2/MSI	20m 1km	BRDF, albedos, surface reflectance
S3/OLCI	500m 10km	BRDF, albedos, surface reflectance
PARASOL/ POLDER	6km	BRDF, BPDF, albedos, surface reflectance
S5p/Tropomi	10km	BRDF, albedos, surface reflectance

Selected AERONET stations



3. Surface reference dataset: validation of satellite retrieval



Requirements BRDF/albedo	Uncertainties	
	Albedo <= 0.03	Albedo > 0.03
Target	0.04	0.03 or 10%
Optimal	0.02	0.01 or 5%

4. Synergetic satellite + AERONET retrieval: Studies of BRDF modelling uncertainties