- GRASP software package -

Customizing GRASP general retrieval software for specific high-performance applications

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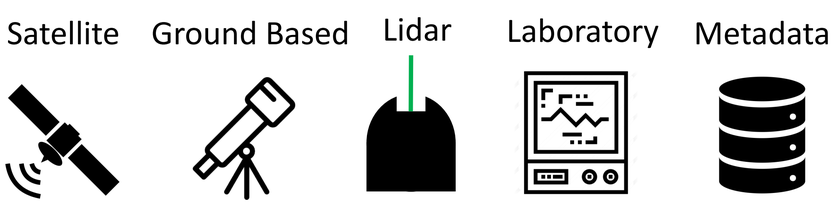
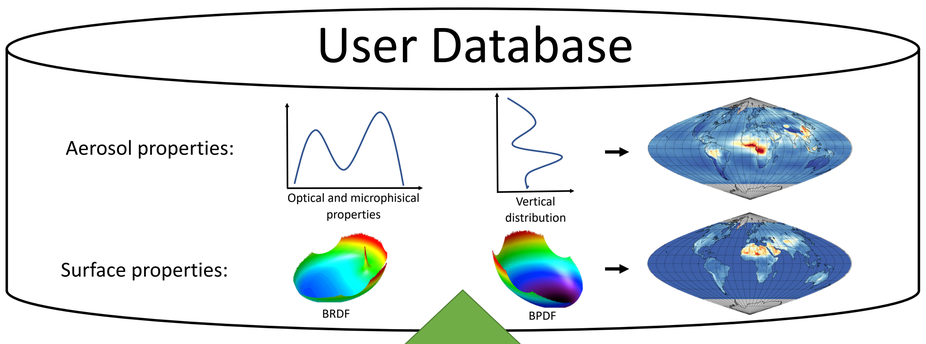
Generalized Retrieval of Atmosphere and Surface Properties (GRASP) developed by *Dubovik et al., (2011, 2014)* is an algorithm that allows for retrieving detailed aerosol properties from remote sensing observations. GRASP is based on generalized inversion scheme and uses rather general forward model for atmospheric radiation simulation. As a result, the algorithm is versatile and can be applied to many different sensors from ground based instruments to satellites.

Realization of all these concepts in efficient computational routine is a challenge from the technical point of view: the software must be flexible enough to be adapted to all instruments without degradation in a performance. Additionally, utilization of a priori constraints on time and space must be carefully developed to be efficient in memory usage.





Custom pieces of software developed for specific use case

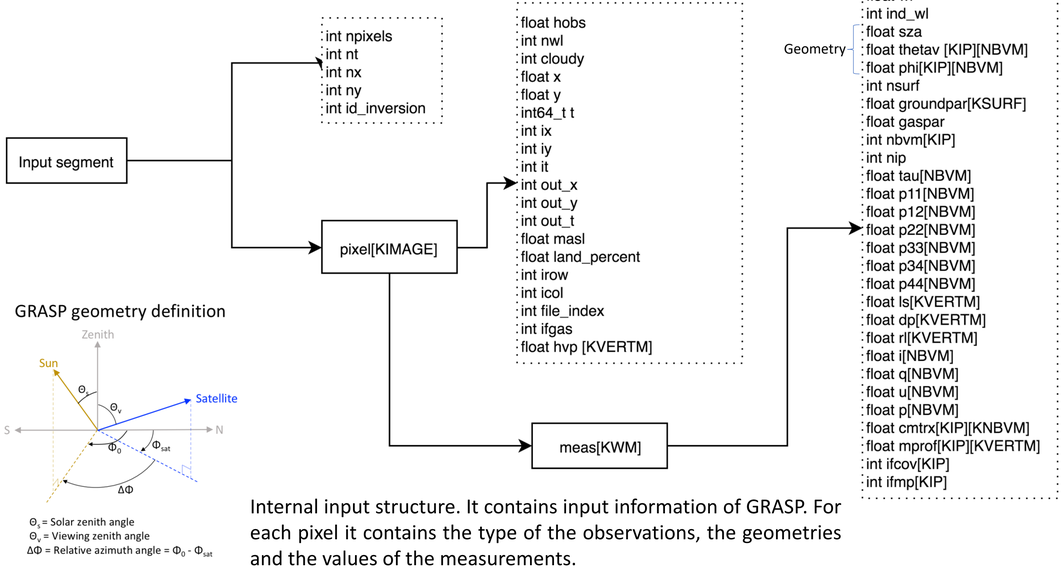
GRASP SAS offers services around GRASP Code like developing these specific extensions

Input Driver

Output Function

GRASP Software

Input Structure



GRASP geometry definition

Θs = Solar zenith angle
Θv = Viewing zenith angle
ΔΦ = Relative azimuth angle = Φ0 - Φsat

Internal input structure. It contains input information of GRASP. For each pixel it contains the type of the observations, the geometries and the values of the measurements.

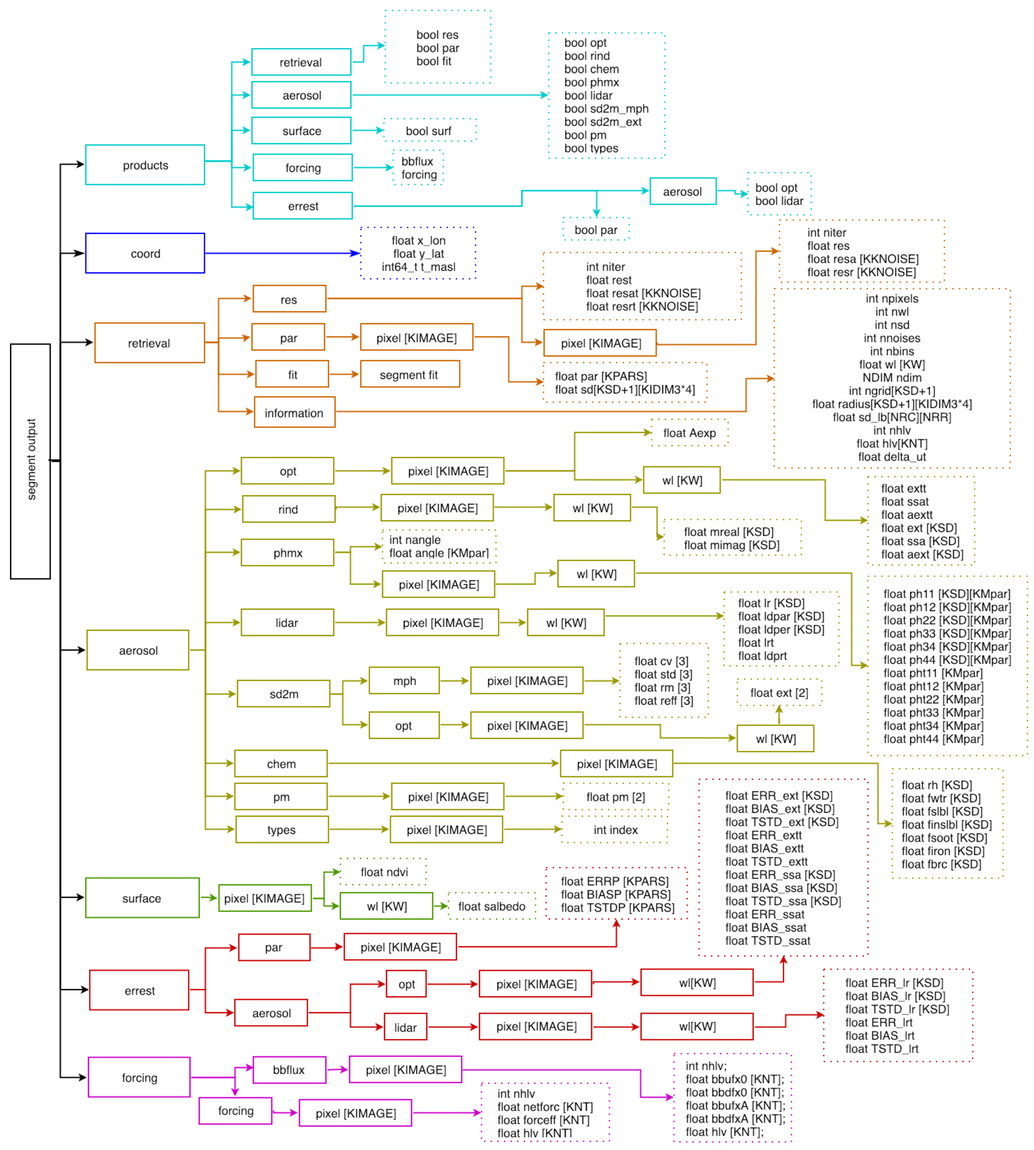
Input

Core of retrieval code

GRASP OPEN

Output

Output Structure



Internal output structure (source: www.grasp-open.com/tech-doc). It contains all products from GRASP. Depending the inversion strategy some will not be available. Main indices: KIMAGE=number of pixels; KW=number of wavelengths; KSD=number of modes (e.g. fine & coarse); KPARS=number of retrieve parameters

Settings

Algorithm configuration defines inversion strategy. GRASP SAS analyses and studies customer data and proposes the optimum settings files

These features are essential for optimizing performance of the GRASP retrieval production environment where large datasets, as for example satellite images, have to be processed. General concepts such as the geometry of the measurements, type of measurements (radiance, backscattering profile, polarization, etc.) are encapsulated into the core of GRASP while all instrument-specific features are defined in the extensions. This creates an ecosystem of extensions that simplify the use of the code for diverse specific cases generating a convenient structure for further developments. Additionally, the open-source platform allows the participation of scientific community in evolution of GRASP by implementing new features or extensions.

Software download and documentation can be found at: www.grasp-open.com | Extra services and consulting are offered by GRASP SAS: www.grasp-sas.com

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Powered by: Catalysts, GRASP In principle, yes!