BLISS: a backscattering space-borne LIDAR simulator

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Long-term data on clouds and aerosols are of critical importance to accurately model climate change. In particular, CALIPSO-like LIDAR missions give access to data on clouds height, distribution, optical depths... as well as information on aerosol types and concentration.

In this context, BLISS (Backscattering Lidar Signal Simulator) has been developed by CNES and Thales Services to simulate the return signal received by a backscattering space-borne LIDAR and the associated data processing (level 0 to level 2), in order to perform mission dimensioning studies as well as sensitivity studies on instrument or geophysical parameters. Given a specific input scene, it provides the vertical profiles of clouds and aerosol actually in the atmosphere as seen by the LIDAR and can also provide a profile of the first few meters inside the oceans – if any – thus representing the backscattering of light by particles as plankton. It has already especially been used on MESCAL phase 0 and its outputs have been compared with other existing LIDAR codes (like the one developed by NASA LARC).

BLISS user interface, its different modules and an associated end-to-end simulation will be presented.