EXECUTIVE SUMMARY

An IDEAS+ cal/val meeting was held on 5 and 6 July at ESRIN, with 16 presentations covering the full range of cal/val activities included within IDEAS+ except lakes and coastal zones/oceans.

The work represented covered:

- **Level 1**: these include a set of cross-cutting activities, supporting the section's development of improved L0 to L1 processing algorithms, improving traceability and error and uncertainty analyses, and trialling innovative calibration methods. The activities include the data quality and calibration toolbox being developed to assess innovative ways to increase confidence in calibration of optical sensors, including the (A)ATSR and MERIS sensors. The methods developed are expected to lead on to application for Sentinel 2 and 3. For Sentinel 2 MSI, the Radiometric Uncertainty Tool has been developed by NPL, which has been incorporated into SNAP as a plug-in for the Sentinel toolbox, and is available to users. The IMPeTuS (Intercomparison of Multi-sPEctral data over Test Sites) tool has also been developed to allow intercomparison of disparate datasets such as MERIS and SCIAMACHY over stable test sites. As an example of its use, it is currently being applied to comparisons between the MERIS and SCIAMACHY V7 and V8 datasets.

- **Atmosphere and ground-based measurements**: the section is supporting several ground-based activities, both within IDEAS+ and separately. Within IDEAS+, there are several activities contributing to the PANDONIA network development, including acquisition of and operations of Pandora instruments, with an atmospheric composition supersite being developed in Rome at ESRIN and University La Sapienza. Development of an improved tracker for the Pandora is also included, and feedback from IDEAS+' operations to the Pandora developers is also proving valuable. The pulsed Tuneable LAser system for the characterisation of Spectrometers (ATLAS) has been set up at PMOD-WRC, and characterisations are in progress, including of a Pandora. Activities to improve the AERONET European calibration facility at the University of Lille are part of IDEAS+, as well as support to a PhD student. In addition, the ISTINA (Investigation of Sensitivity Tendencies and Inverse Numerical Algorithm) project aims to lead to advances in aerosol remote sensing. This links in to the ground-based measurements, as well as the CAWA (Clouds, Aerosols and WAter vapour products for Sentinel-3/OLCI) project, as aerosol retrievals are an output.

- **Terrestrial**: IDEAS+ is supporting Ferran in the coordination of the ACIX (Atmospheric Correction Inter-comparison Exercise) which is a CEOS WGCV initiative supported by ESA in assessing different atmospheric correction schemes for optical sensors such as Sentinel 2 MSI. A similar comparison exercise is being performed for PROBA-V cloud detection. Ground-based cal/val measurements are also being performed, with University of Wageningen using a forested site for long-term monitoring, and NRC-Canada providing ground measurements and airborne hyperspectral data for Sentinel 2 and Landsat 8 cal/val. A tool for data fusion between Sentinel 2 and Landsat 8 is also being developed within IDEAS+ and will be available in the autumn.

It's intended to look at further evolution and new proposals for activities, in particular to exploit synergies (e.g. between ground data measurements and the algorithm developments such as ISTINA) and opportunities for further collaboration (e.g. between University of Lille and PMOD-WRC).

The section sees the cal/val activities as critically important to the quality and uptake of ESA's data, and intends to pursue a continuous evolution of the activities by continuing to collect and assess recommendations for further improvements in data quality.