SESSION 3: LAND PROCESSES & FORESTS II
Chairman: J. Moreno

The topics covered in this session can be classified as follows:

(a)   Forest monitoring, inventories and carbon dynamics

(b)   Biological effects on soil reflectance (effects on calibration targets, long-term monitoring in Africa)

(c)   Morphological recognitions (craters, archaeological discoveries)

(d)   Pre-Operational / Institutional uses (Fire risk, BACCHUS, TIGER)

(e)   Joint applications with multiple satellite data (KOMPSAT, ASTER-emissivity)

It can be noted than 9 were the presentations initially scheduled in this session. Rather than cancellations, there were actually 11 presentations in final programme. Since one author presented two papers together, we had in fact 12 topics covered under this session. It must be also emphasized that presentations addressed mostly new activities and introduced new users and new applications from CHRIS data. From the presentations made in this session it was clear that CHRIS data are no longer used as a technology demonstration, but as a real tool for actual research and applications:

– J. Hill, University of Trier (Germany), presented a new proposal for 2005 with the objective of estimating forest biophysical characteristics through coupled atmosphere-reflectance model inversion using hyperspectral multi-directional remote sensing data, as a contribution to future forest inventory strategies based on CHRIS data.

– J. Earl, LogicaCMG (UK), presented a potential innovative use of CHRIS data for automatic recognition of crater-like structures in terrestrial images, by making use of geometrical and structural features that can be recognised in CHRIS data based on spatial and spectral properties, such as circular structures.

– M. Govender, ESA/ESRIN (Italy), presented by D. Fernandez, reviewed the status of some Tree Moisture Stress South Africa/TIGER projects that make use of CHRIS data. Objectives were indicated as data is still under processing, being water resources the driver for these applications.

– F. Del Frate, University Tor Vergata (Italy), described an interesting application of CHRIS data for the monitoring of vineyards in the context of the BACCHUS precision farming investigation. Although multitemporal monitoring is somehow limited, the indicated potential of high-spectral-resolution multi-angular CHRIS observations in such demanding applications opens new ways for operational uses of the data.

– T. Milton, University of Southampton (UK), discussed a relevant aspect for multitemporal vicarious calibration of satellite sensor, such as CHRIS, over so called ground calibration (invariant) targets. The no-invariance in the reflectance of such calibration targets was addressed, emphasizing the need of continuous monitoring.

– B. Weber, University of Kaiserslautern (Germany), presented by B. Hoersch showed the development and implementation of remote sensing techniques for long-term monitoring of Biological Soil Crusts (BSCs) in several sites in Africa, by making use of the unique spectral capabilities of CHRIS to detect small amounts of green material over varying soils.

– Y. Kim, KARI (Korea), presented by B. Hoersch, introduced the KOMPSAT series of satellites and described joint experiments by combining PROBA CHRIS and KOMPSAT data for further synergistic applications. The complementary satellite capabilities can be used in such new applications.

– A. Kuusk, Tartu Observatory (Estonia), introduced another new project making use of CHRIS data, oriented to the validation of directional multispectral forest reflectance models. Forest parameters will be estimated by model-inversion from CHRIS data over a well-monitored test site located in Estonia.

– J.C. Jimenez-Muñoz, University of Valencia (Spain)' (presented by J. Moreno) made a comparison of different techniques (spectral indices, unmixing) to retrieve from CHRIS/PROBA data estimates of Fractional Vegetation Cover to be later used for land surface emissivity retrievals to estimate surface temperature from ASTER data, emphasizing the angular effects and the impact on emissivity values due to the so called cavity effect.

– P. Martinez, University of Extremadura (Spain), presented two new projects, one oriented to new methodologies for mapping wild fires risk in the Extremadura's Regional Park by combination of CHRIS data with other data sources, and a second new project oriented to the innovative use of CHRIS/PROBA imagery in archaeological exploration in the same region.

– Finally, P. Lewis, UCL (UK), reviewed recent applications developed by his team in the context of CHRIS data exploitation, in particular the use of CHRIS data is support of carbon dynamics studies at Harwood Forest, UK, and other applications in several sites in UK. Modelling aspects and innovative data exploitation techniques were also addressed.

In definitive, we had in this session a kind of balance between innovation and mature applications, including: (a) Mature cases, already ready to use CHRIS data almost directly in their applications, (b) "Exploration" cases for new potential applications (new users in most cases) and (c) "Pre-operational" cases: CHRIS as a demonstrator of possible future applications.

Recommendations from Session 3 can be summarised as follows:

- Possible increase in gains for some modes to allow more precise computation of PRI

- Some standardisation in modelling / information extraction techniques is needed

Processing aspects for CHRIS data for integration with other satellite data and full exploitation of the multitemporal capabilities were also addressed issues.