Land Processes and Forests I
Presentations

- **Frederico Magnani**, ‘Estimation of vegetation photochemical processes: an application of the Photochemical Reflectance Index at the San Rossore test site.’
- **Heike Bach**, ‘Analyses of hyperspectral and directional data for agricultural monitoring using a canopy reflectance model — progress in the Upper Rhine valley and Baasdorf test sites.’
- **Francesco Vuolo**, ‘Assessment of LAI retrieval accuracy by inverting a RT model and a simple empirical model with multiangular and hyperspectral CHRIS/PROBA data from SPARC.’
- **Christian Nadeau**, ‘Leaf Area Index map generation using CHRIS data.’
- **Anne Bourguignon**, ‘Estimating crop residue cover by remote sensing using the visible/near-infrared bands.’
- **Guiseppi Ottavianelli**, ‘Assessment of hyperspectral and SAR remote sensing for solid waste landfill management’.
Exploiting the hyperspectral capabilities of CHRIS/PROBA

Frederico Magnani (Bologna, Italy)

- Successful use of CHRIS’s narrow spectral wavebands to determine the Photochemical Reflectance Index (PRI) of the forest canopy (*Pinus pinaster*) at San Rossore.
- Basis for estimating Light Use Efficiency (LUE) of canopy.
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Christian Nadeau (MDA, Canada)
- Successful, semi-operational application of CHRIS data to estimate Green LAI (GLAI) of natural rangeland and spring wheat fields.
- Based on MTVI2 and MSAVI vegetation indices, used as input to plant growth models.
Hyperspectral and multi-angle capabilities of CHRIS/PROBA

- Heike Bach (VISTA GmbH, Germany)
  - Combination of four-stream soil-leaf-canopy (SLC) reflectance model with multi-look CHRIS/PROBA data to retrieve various biophysical (e.g. LAI) and biochemical (Cab) properties of agricultural crops.
  - Demonstrated ability to retrieve and map parameters relating to canopy structure (LIDF) from CHRIS/PROBA multi-angle data, which may be used for crop discrimination and crop state mapping.
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- Francesco Vuolo (Naples, Italy)
  - Successfully used hyperspectral and multi-angle analysis to produce maps of LAI based on a number of different reflectance models (CLAIR and PROSPECT/SAILH).
New studies and applications of CHRIS/PROBA

Anne Bourguignon (BRGM, France)

- Showed how a combination of image data from CHRIS/PROBA, SPOT and ASAR can be used to inform studies of soil erosion and excessive run-off.
- CHRIS/PROBA data used to estimate the crop residue cover at two agricultural sites near Toulouse and Strasbourg.
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Guiseppi Ottavianelli (Cranfield, UK)
- Considered the potential application of CHRIS/PROBA data, in conjunction with InSAR data, to identify and classify solid-waste landfill sites.
Concluding observations and thoughts

- Demonstrated considerable potential of combined hyperspectral and multi-angle image data.
  - Promoted developments of underpinning theory and models.
Concluding observations and thoughts

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  - Promoted developments of underpinning theory and models.
- Significant issues in terms of dealing with wavelength and radiometric calibration issues and atmospheric and geometric correction matters.
  - Sophisticated methods being developed, and starting to become ‘standard’.
Concluding observations and thoughts

- Joint retrieval of land-surface bidirectional reflectances and atmospheric optical properties

- AOT retrieved from multi-look AATSR images (North and Grey, Swansea).
Concluding observations and thoughts

What can we do to promote the CHRIS/PROBA mission further?
- Make example processed data sets available?
- Make models or algorithms available via web site?
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  - Post-SPECTRA
  - BIOSAT/PHI, Carbon-3D, KOMPSAT?
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- Diolch yn fawr!