USING HYPERION SATELLITE DATA FOR VEGETATION PROPERTIES ESTIMATION

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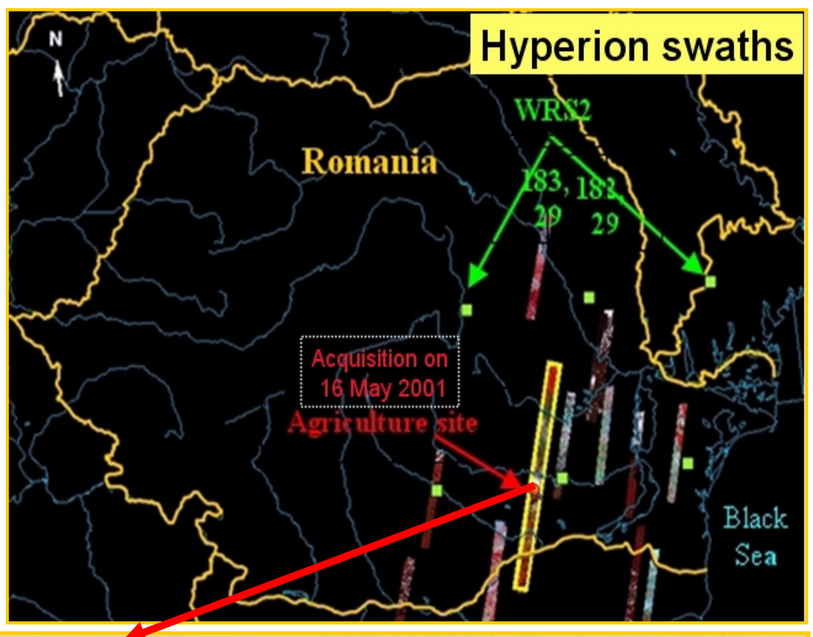
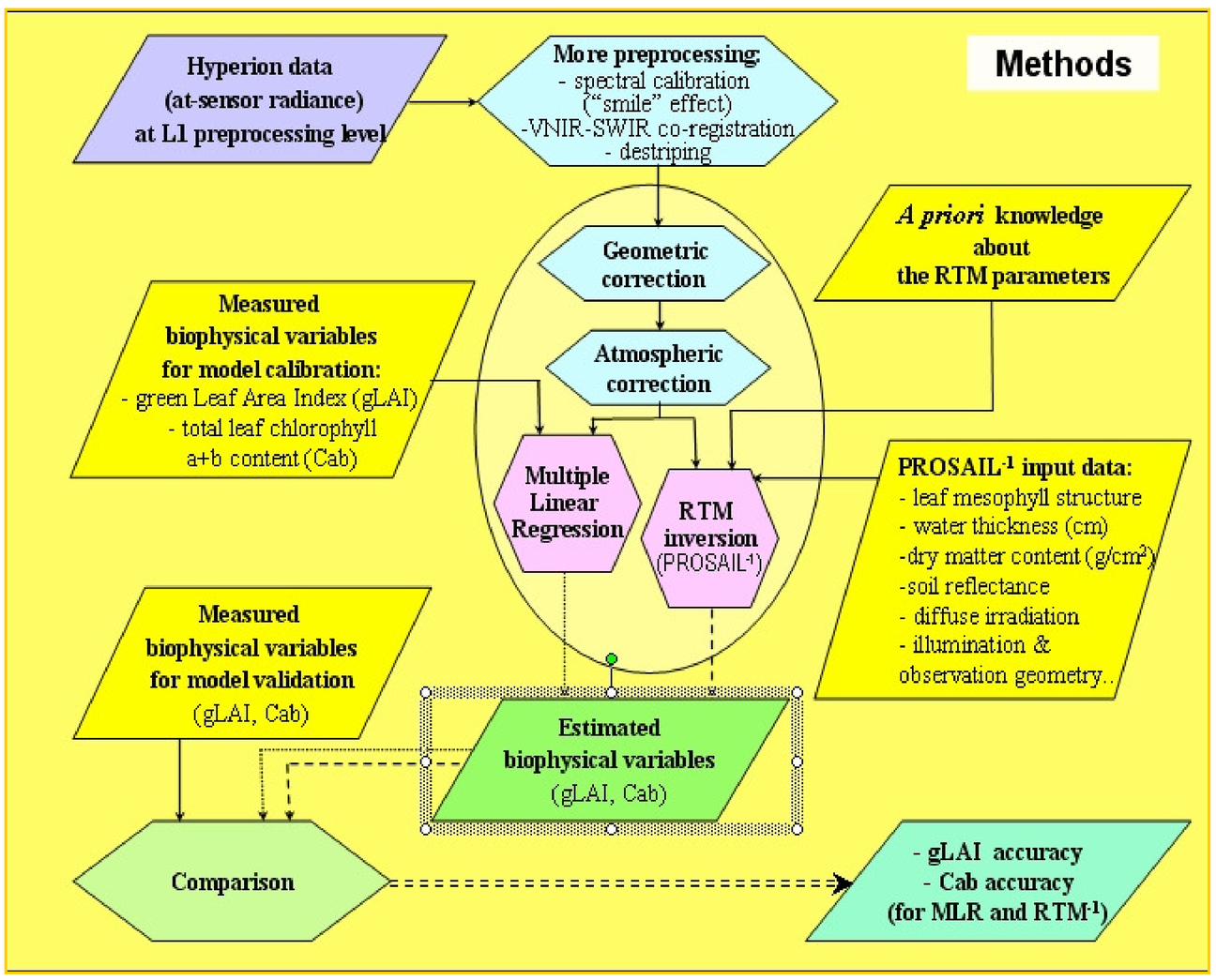
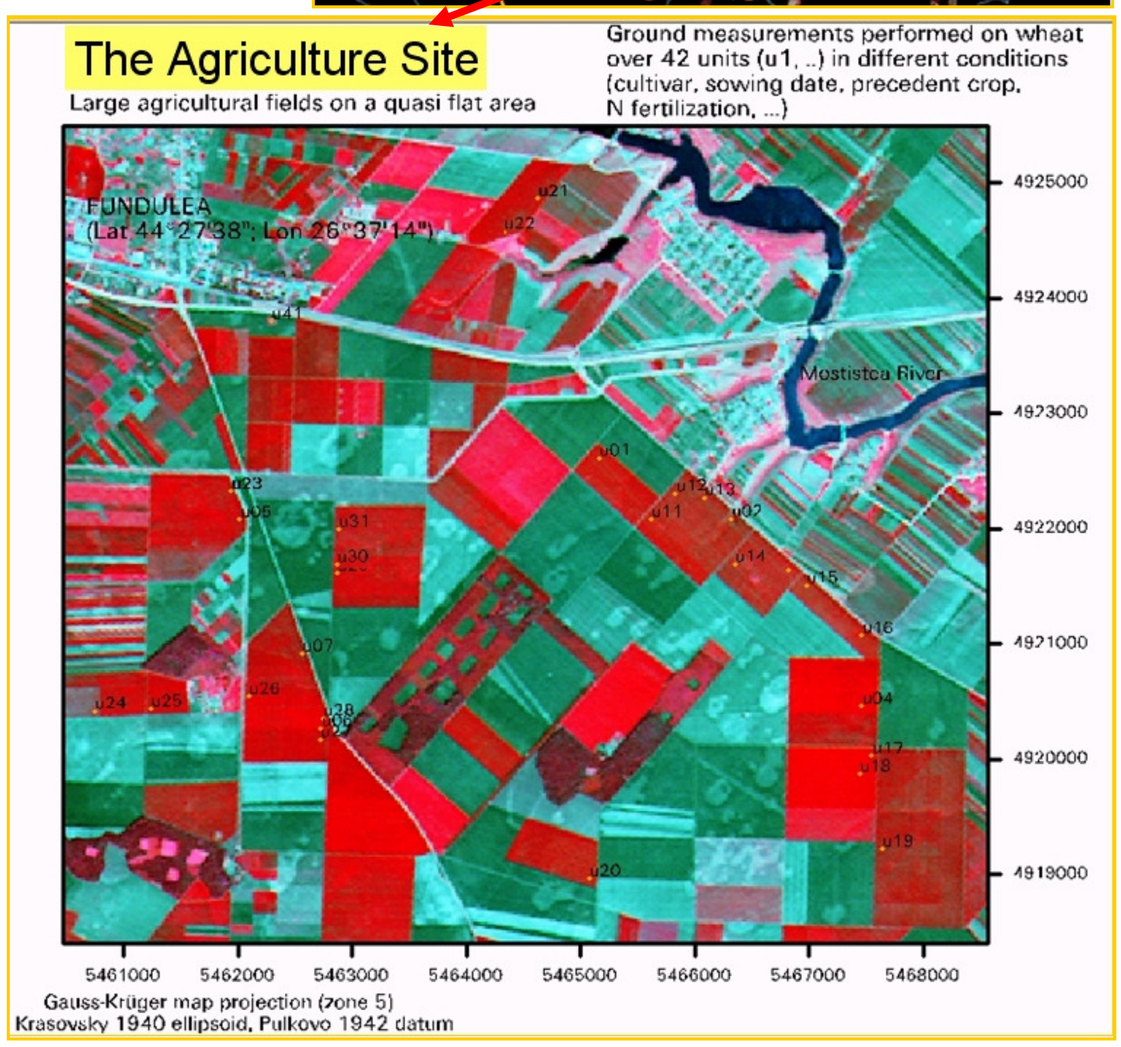
Main Objective: ***Investigation of the current capacity of high spectral resolution and high spatial resolution Hyperion images acquired by EO-1 satellite to accurately estimate green LAI (gLAI) and total leaf chlorophyll a+b content (Cab)***

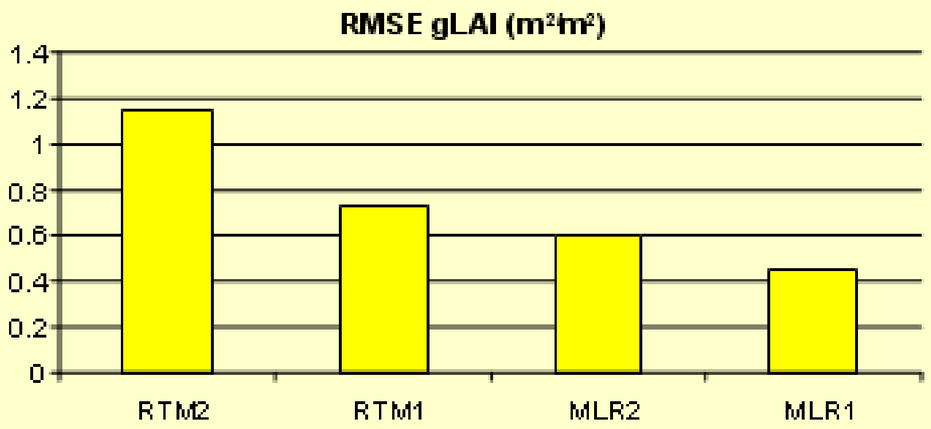
This study was an extension in the spectral dimension of the ADAM Project, a French-Romanian co-operation related to the spatial data assimilation and definition of characte-ristics for future space missions dedicated to the field-scale agriculture (http://kalideos.cnes.fr/spip.php?article68).

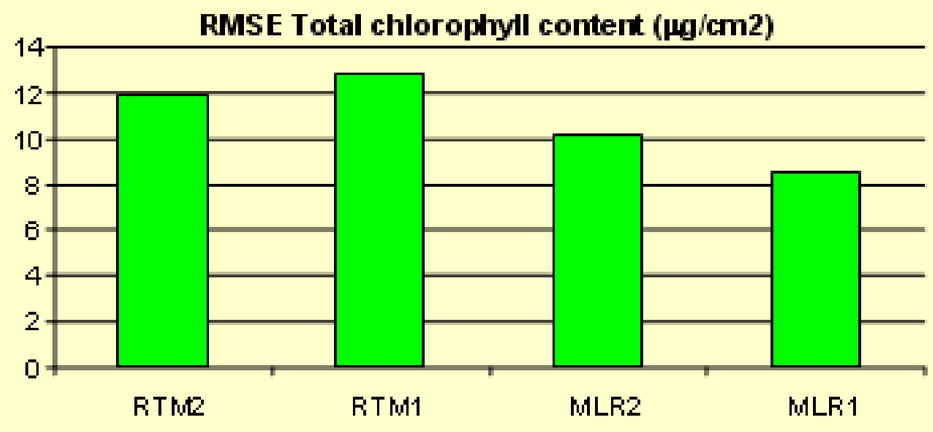






Results





The graphs illustrate the best results in gLAI and Cab estimation for the statistic approach (MLR 1&2) and physical approach (RTM 1&2). Best results were obtained for Leaf Chlorophyll Index LCI=(R850-R710)/(R850-R680)

Conclusion

This investigation on an agricultural area complemented other findings proving that knowledge and technology on space hyperspectral remote sensing are mature enough to monitor vegetation at the field scale.

However, this experiment highlighted the great attention to pay to the preprocessing of the space hyperspectral data to get accurate top of cover reflectance values.

Operational monitoring of vegetation at the field scale requires timely information, thus future research should focus on automatic procedures for co-registration and atmospheric correction to complement narrow band signals of better radiometric accuracy and SNR.

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Dissemination of results

MIAO, Y., MULLA, D.J., RANDALL, G.W., VETSCH, J.A., VINTILĂ, R., 2009, Combining chlorophyll meter readings and high spatial resolution remote sensing images for in-season site-specific nitrogen management of corn. *Precision Agriculture,* ed. Springer Science, ISSN 1385-2256 (Print), Vol. 10 (1), 45-62; ISSN 1573-1618 (Online) DOI: 10.1007/s11119-008-9091-z

MIAO, Y., MULLA, D.J., RANDALL, G.W., VETSCH, J.A., VINTILĂ, R., 2007, Predicting chlorophyll meter readings with aerial hyperspectral remote sensing for in-season site-specific nitrogen management of corn, *Precision Agriculture'07* (ed. J. V. Stafford, Wageningen Academic Publishers, The Netherlands), ISBN 978-90-8686-024-1, p. 635-642

VINTILĂ, R., 2008, Use of Hyperion Data for Vegetation Properties Estimation (conference presentation at the *XXI-th Congress of Int. Society of Photogrammetry and Remote Sensing*)

MIAO, Y.; MULLA, D.J.; RANDALL, G.W.; VETCH, J.A.; VINTILĂ, R., 2008, Evaluating Hyperspectral Vegetation Indices for Potential Application in Precision Nitrogen Management (conference presentation at the *XXI-th Congress of Int. Society of Photogrammetry and Remote Sensing*)

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