## **Understanding the Carbon and Water Cycles using SMOS Data and Models**

## THURSDAY 13 NOVEMBER 2014

|  | SESSION I: INTRODUCTION  |                           |                        |   |  |  |
|--|--|---------------------------|------------------------|---|--|--|
| 9:00-9:20  | Welcome and introduction to the workshop   | Drusch                    | Matthias               | ESA   |  |  |
| 9:20-9:40  | ESA's Earth Observation Programme: Relevance to water & carbon cycle   | Borgeaud                  | Maurice                | ESA   |  |  |
| 9:40-10:00   | SMOS mission status  | Mecklenburg               | Susanne                | ESA   |  |  |
|  |  |                           |                        |   |  |  |
|  | SESSION II: VEGETATION AND CARBON CYCLE - METHODS AND VALIDATION Chair: Jennifer Grant   |                           |                        |   |  |  |
|  | (Lund University) and Simone Bircher (CESBIO)  |                           |                        |   |  |  |
| 10:00-10:30  | Keynote I: The need for soil moisture data for evaluation and optimisation of a global Land Surface Model  | Mc Bean                   | Natasha                | IPSL - LSCE   |  |  |
| 10:30-11:00  | Keynote II: Carbon and water cycle interactions from space   | de Jeu                    | Richard                | VU University<br>Amsterdam  |  |  |
|  |  | Dolman                    | Han                    | VU University<br>Amsterdam  |  |  |
| 11:00-11:20  | COFFEE BREAK   | •                         |                        |   |  |  |
| 11:20-11:40  | Retrieval, validation and scientific content of forest optical depth   | Vittucci                  | Cristina               | Tor Vergata University  |  |  |
| 11:40-12:00  | A global-scale vegetation water product from SMOS optical depth  | Grant                     | Jennifer               | Lund University   |  |  |
| 12:00-12:20  | Three years of ground-based L-band radiometry in the Alps: topography, vegetation and snow issues  | Pellarin                  | т.                     | CNRS  |  |  |
|  | Using remotely sensed soil moisture to estimate vegetation phenology for   |                           |                        |   |  |  |
| 12:20-12:40  | seasonally-arid regions  | Olén                      | Niklas                 | Lund University   |  |  |
|  | Analysis of the behavior of microwave L-band emissions of organic-rich soils in  |                           |                        | Spatiales de la   |  |  |
| 12:40-13:00  | the northern cold climate zone in support of the SMOS mission  | Bircher                   | Simone                 | Biosphère (CESBIO),   |  |  |
| 13:00-14:00  | LUNCH  |                           |                        |   |  |  |
|  |  |                           |                        |   |  |  |
|  | SESSION III: VEGETATION AND CARBON CYCLE - APPLICATIONS, Chair: Marko Scholz (Lund University)   |                           |                        |   |  |  |
|  | and Klaus Scipal (ESA)   |                           |                        |   |  |  |
|  | Keynote I: Potential of combining SMOS products with other vegetation state  |                           |                        |   |  |  |
| 14:00-14:30  | /functioning information to improve the description of surface-atmosphere  |                           |                        |   |  |  |
|  | carbon exchanges in global dynamical models.   | Moreno                    | Jose                   | University of Valencia  |  |  |
| 14:30-15:00  |  |                           |                        |   |  |  |
| 14:30-15:00  | Keynote II: Better matching satellite Earth surface observations within numerical weather prediction models: why & how   | Balsamo                   | Gianpaolo              | ECMWF   |  |  |
| 14:30-15:00  |  | Balsamo                   | Gianpaolo              | ECMWF   |  |  |
|  | numerical weather prediction models: why & how   | <b>Balsamo</b><br>Scholze | <b>Gianpaolo</b> Marko | ECMWF Lund University   |  |  |
| 15:00-15:20  | numerical weather prediction models: why & how  Constraining terrestrial carbon fluxes by assimilating the SMOS soil moisture product into a model of the global terrestrial biosphere  Quantifying the synergistic benefits of remotely sensed soil moisture and solar  |                           |                        |   |  |  |
| 15:00-15:20  | numerical weather prediction models: why & how  Constraining terrestrial carbon fluxes by assimilating the SMOS soil moisture product into a model of the global terrestrial biosphere  Quantifying the synergistic benefits of remotely sensed soil moisture and solar induced fluorescence for global agricultural monitoring  |                           |                        | Lund University Jet Propulsion Laboratory   |  |  |
| 15:00-15:20<br>15:20-15:40                               | numerical weather prediction models: why & how  Constraining terrestrial carbon fluxes by assimilating the SMOS soil moisture product into a model of the global terrestrial biosphere  Quantifying the synergistic benefits of remotely sensed soil moisture and solar induced fluorescence for global agricultural monitoring  A SMOS/MODIS Synergistic Approach to Assessing Bioenergy-induced Soil   | Scholze<br>Drewry         | Marko<br>D.            | Lund University Jet Propulsion Laboratory University of South                                 |  |  |
| 15:00-15:20<br>15:20-15:40                               | numerical weather prediction models: why & how  Constraining terrestrial carbon fluxes by assimilating the SMOS soil moisture product into a model of the global terrestrial biosphere  Quantifying the synergistic benefits of remotely sensed soil moisture and solar induced fluorescence for global agricultural monitoring  | Scholze                   | Marko                  | Lund University Jet Propulsion Laboratory   |  |  |
| 15:00-15:20<br>15:20-15:40<br>15:40-16:00                | numerical weather prediction models: why & how  Constraining terrestrial carbon fluxes by assimilating the SMOS soil moisture product into a model of the global terrestrial biosphere  Quantifying the synergistic benefits of remotely sensed soil moisture and solar induced fluorescence for global agricultural monitoring  A SMOS/MODIS Synergistic Approach to Assessing Bioenergy-induced Soil Moisture Variations in the Mississippi River Basin, USA   | Scholze<br>Drewry         | Marko<br>D.            | Lund University Jet Propulsion Laboratory University of South                                 |  |  |
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| 15:00-15:20<br>15:20-15:40<br>15:40-16:00                | numerical weather prediction models: why & how  Constraining terrestrial carbon fluxes by assimilating the SMOS soil moisture product into a model of the global terrestrial biosphere  Quantifying the synergistic benefits of remotely sensed soil moisture and solar induced fluorescence for global agricultural monitoring  A SMOS/MODIS Synergistic Approach to Assessing Bioenergy-induced Soil Moisture Variations in the Mississippi River Basin, USA  COFFEE BREAK   | Scholze<br>Drewry         | Marko<br>D.            | Lund University Jet Propulsion Laboratory University of South Carolina                        |  |  |

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## FRIDAY 14 NOVEMBER 2014

|             | SESSION IV: WATER CYCLE: RETRIEVAL AND VALIDATION, Chair: Chris Rüdiger (Monash University) and                              |                         |           |                           |  |  |
|-------------|--|-------------------------|-----------|---------------------------|--|--|
| 9:00-9:30   | Keynote: SMOS' contribution to a better understanding to the water cycle: overview on SMOS soil moisture data products       | Yann                    | Kerr      | CESBIO                    |  |  |
| 9:30-9:50   | Soil moisture dynamics across a continental scale - seasonal patterns  | Rüdiger                 | Christoph | Monash University         |  |  |
| 9:50-10:10  | Spatio-temporal merging of soil moisture from active and passive microwave   | Tomer                   | Sat Kumar | CESBIO                    |  |  |
|             | Improving Remote Sensing of Rainfall Through SMOS Soil Moisture Data: a Comparison of Techniques                             | Brocca                  | L.        | National Research Council |  |  |
| 1:30-11:00  | COFFEE BREAK   |                         |           |                           |  |  |
| 11:00-11:20 | Intercomparison of Global Soil Moisture Data Products from SMOS and AMSR2 and their Impact on Land Surface Model Simulations | Zhan                    | X.        | NOAA-NESDIS               |  |  |
| 11:20-11:40 | The Challenge of Retrieving SM from SMOS under Forests: Issues, Advances, and Comparisons with Measurements in North America | Ferrazzoli              | P.        | Tor Vergata University    |  |  |
| 11:40-12:00 | Multi-sensor Soil Moisture Retrieval using Neural Networks   | Rodriguez-<br>Fernandez | N.        | CNRS                      |  |  |
| 12:00-13:00 | DISCUSSION   |                         |           |                           |  |  |
| 13:00-14:00 | LUNCH  |                         |           |                           |  |  |
|             |  |                         |           |                           |  |  |
|             | SESSION V: WATER CYCLE: ASSIMILATION AND APPLICATION, Chair: Joaquin Munoz-Sabater (ECMWF) and                               |                         |           |                           |  |  |
| 14:00-14:30 | Keynote: Monitoring extreme hydrological events with SMOS data: Monitoring droughts and leveraging flood risk                | Al Bitar                | Ahmad     | CESBIO                    |  |  |
|             | Assimilation of the SMOS Soil Moisture in a Hydrological Model over an African   |                         |           |                           |  |  |
| 14:30-14:50 |  | Leroux                  | D.        | LTHE                      |  |  |
| 44.50.45.40 | Assimilation of SMOS Observations to Improve Streamflow Simulation in the  |                         |           | a                         |  |  |
| 14:50-15:10 | Murray Darling Basin, Australia  | Lievens                 | H.        | Ghent University          |  |  |
| 15:10-15:30 | Use of SMOS Data in a Coupled Land-atmospheric Model; Sensitivity to Different Model and Observations Scenarios              | Munoz Sabater           | J.        | ECMWF                     |  |  |
| 15:30-15:50 | Assimilating SMOS soil moisture observations to improve terrestrial evaporation estimates over continental Australia         | Martens                 | В.        | Ghent University          |  |  |
| 15:50-16:30 | DISCUSSION (including coffee break)  |                         |           |                           |  |  |
| 16:30-17:00 | WRAP UP OF WORKSHOP  |                         |           |                           |  |  |