

*Proceedings of*

# **Dragon 2 Final Results & Dragon 3 Kick-Off Symposium**

25–29 June 2012  
Beijing, P.R. China

*Organised by*

**The National Remote Sensing Center of China (NRSCC)  
European Space Agency (ESA)**

**European Space Agency  
Agence spatiale européenne**

*Symposium Committee*

**Sponsors**

Ministry of Science and Technology of China (MOST)  
European Space Agency (ESA)

**Organisers**

National Remote Sensing Center of China (NRSCC), MOST  
Directorate of Earth Observation Programmes, ESA  
Institute of Forest Resource Information Techniques (IFRIF), Chinese Academy of Forestry (CAF)

**Co-Organiser** (In Alphabetical Order)

Academy of Opto-Electronics (AOE), Chinese Academy of Science (CAS)  
Beijing Research Center for Information Technology in Agriculture  
Capital Normal University  
Center for Earth Observation and Digital Earth (CEODE), CAS  
Chinese Academy of Surveying and Mapping  
Cold and Arid Regions Environmental and Engineering Research Institute, CAS  
Institute of Atmospheric Physics, CAS  
Institute of Crustal Dynamics, China Earthquake Administration (CEA)  
Institute of Remote Sensing Applications, CAS  
National Satellite Meteorological Center  
National Disaster Reduction Center of China, Ministry of Civil Affairs  
Wuhan University

<i>Publication</i>	Proc. of 'Dragon 2 Final Results & Dragon 3 Kick-Off Symposium', Beijing, P.R. China (ESA SP-704, January 2013)
<i>Edited by</i>	L. Ouwehand ESA Communications
<i>Published and distributed by</i>	ESA Communications ESTEC, Noordwijk, The Netherlands
<i>Price</i>	60 Euro
<i>ISBN</i>	92-9092-268-1
<i>ISSN</i>	1609-042X
<i>Copyright</i>	© 2013 European Space Agency

# CONTENTS

## Foreword

*English & Chinese*

## Opening Session

*Chairs: J. Li & K. Bergquist*

Dragon 2 Programme Achievements and Cooperation

*Y.-L. Desnos, Z. Li, A. Zmuda & Z. Gao*

## Hydrology – ID. 5322

*Chairs: X. Li & M. Menenti*

Key Eco-Hydrological Parameters Retrieval and Land Data Assimilation System Development  
in a Typical Inland River Basin of China's Arid Region – Final Results

*X. Li, S. Wang & X. Han*

Multi-Annual Data Products on Turbulent Heat Fluxes at the Local and Continental  
Scale Using AATSR and FY-2 Data

*M. Menenti, H. Ghafarian, B. Tang et al.*

Improving Accuracy in Land Surface Heat and Water Fluxes Estimation by Multiparameterizations  
and Multi-Source Satellite Observations

*L. Jia, Z. Li, Z. Ruan et al.*

## Water Resources – ID. 5281

*Chairs: J. Li & M. Mancini*

Satellite Data and Distributed Hydrological Model for Water Resources Assessment  
in the Upper Yangtze River Basin

*M. Mancini, J. Li, C. Corbari et al.*

## Urbanisation – ID. 5317

*Chairs: P. Du & Y. Ban*

Satellite Monitoring of Urbanization in China for Sustainable Development: Final Results

*Y. Ban, P. Gong, P. Gamba & P. Du*

Monitoring Urbanization Trends in China Using Moderate Resolution Satellite Data

*L. Wang, P. Gong, Q. Ying & C. Li*

Fusion of SAR and Optical Features for Land Use/Land Cover Classification in Urban Areas

*M. Aldrighi & P. Gamba*

Segmentation of Multi-Temporal Envisat ASAR and HJ-1B Optical Data Using an Edge-Aware Region Growing and Merging Algorithm

*A. Jacob & Y. Ban*

### **EO & Sport Events – ID. 5295**

*Chairs: H. Gong & C. Cartalis*

Use of Earth Observation in Support of Major Sport Events: Case Study for the Athens, Beijing and London Olympic Games

*H. Gong, W. Zhao, X. Li & W.j. Zhao*

Use of Earth Observation in Support of Major Sport Events: The Post Games Assessment of the Sporting Events of the Olympic Games 2004

*D. Asimakopoulos, C. Cartalis, M. Petrakis et al.*

### **Drought Monitoring – ID. 5341**

*Chairs: Y. Ma & B. Su*

Drought Monitoring for the Middle Reaches of Yarlung Zangbo River and its Two Tributaries from Satellite Images

*L. Zhong, Y. Ma, W. Ma et al.*

Drought Monitoring, Prediction and Adaptation under Climatic Changes

*Z. Su, Y. Ma, R. van der Velde et al.*

### **Water Quality – ID. 5351**

*Chairs: F. Shen & S. Salama*

Estuarine, Inland and Coastal Water Quality Monitoring Using Earth Observation Data

*D. Pan*

### **SMOS CAL/VAL – ID. 5252**

*Chairs: W. Zhang & M. Menenti*

SMOS CAL/VAL in China – Dragon-2 Final Results

*W. Zhang & Y. Kerr*

### **Crop Monitoring – ID. 5279**

*Chairs: B. Wu & Q. Dong*

Improving Methods of Crop Monitoring with Envisat Data – Final Results

*B. Wu, Q. Li, K. Jia et al.*

An Adapted Regression Estimator Method to Assess the Crop Acreage in Mengcheng County on the North China Plain

*H. Kerdiles, Q. Dong, S. Spyrtos & J. Gallego*

## **River Deltas – ID. 5292**

*Chairs: Y. Ma & L. Kritten*

Final Report of Dragon 2 River Deltas Project

*Y. Ma, T. Cui, G. Ren et al.*

## **Coastal Zones – ID. 5338**

*Chairs: M. He & S. Lehner*

SMOS Sea Surface Salinity Validation in the South China Sea

*Y. Ren, X. Li & Q. Dong*

Sea Surface Wind Field by X-Band TerraSAR-X and Tandem-X

*S. Lehner, X.M. Li, Y.Z. Reu & M.X. He*

## **PolInSAR – ID. 5344**

*Chairs: E. Chen & E. Pottier*

Techniques Deriving Land Cover and Earth Surface Deformation Information from Polarimetric SAR Interferometry - Final Report

*E. Pottier, E. Chen, Z. Li et al.*

Applying PolSAR and PolInSAR to Forest Structure Information Extraction

*E. Chen, Z. Li, W. Li et al.*

First Experiment of IECAS P-Band Quad-Pol SAR System in Circular Imaging Mode

*W. Hong, Y. Li, Q. Li et al.*

## **Monitoring China Seas – ID. 5316**

*Chairs: J. Yang & J. Johannessen*

Some Results from SAR and Optical Sensor Monitoring of China Seas

*J. Yang, X. Lou, P. Chen et al.*

A Radar Modulation Transfer Function for Oceanic Internal Waves

*K.-F. Dagestad, V. Kudryavtsev, J.A. Johannessen et al.*

Investigation of Atmospheric Gravity Waves and Oceanic Internal Waves Using Envisat Synthetic Aperture Radar Images

*W. Alpers, C.M. Cheng, C. Guo et al.*

Study of a Winter Monsoon Front and a Squall Line over the South China Sea by Synergetic Use of Synthetic Aperture and Weather Radar Data

*W. Alpers, C.M. Cheng, P.W. Chan et al.*

## **Forest Ecosystems – ID. 5314**

*Chairs: Z. Li & C. Schmullius*

Forest Dragon 2: Final Results of the European Partners

*C. Schmullius, R. Leierer, I. Burjack et al.*

Forest Dragon 2: Advances of Chinese Partners During the Fourth Project Year

*Y. Pang, Z. Li, E. Chen et al.*

## **Forest Fires – ID. 5258**

*Chairs: X. Qin & J.L. Casanova*

Early Warning and Damage Assessment for Forest Fire

*J. L. Casanova, X. Qin, Z. Li et al.*

A Semi-Automated Methodology for Burned Area Mapping Using HJ-CCD Data in China

*X. Zhu, X. Qin, F. Yang et al.*

Method of National Vegetation Types Identification Based on FY-3A MERSI Data

*B. Hu, X. Qin, F. Yang et al.*

## **Dragoness – ID. 5334**

*Chairs: M. He & J. Johannessen*

Dragon in Support to Harmonizing European and Chinese Marine Monitoring for Environment and Security System

*J.A. Johannessen, M.-X. He, W. Alpers et al.*

## **Wetlands – ID. 5264**

*Chairs: J. Li & H. Yesou*

Twelve Year of Water Resource Monitoring over the Yangtze Middle Reaches Exploiting Dragon Time Series and Field Measurements

*C. Huber, J. Li, S. Daillet et al.*

The Change Analysis of Wetland Landscape Based on Remote Sensing Data in Dongting Lake, China

*Q. Huang, J. Jiang, H. Yesou & X. Lai*

The Application of Lidar and Aerial Images in Wetland for Ground Elevation and Vegetation Height Estimation

*C. Li, Z. Liu, L. Tang & F. Li*

Indicator Development for Potential Presence of *Schistosomiasis Japonicum*'s Vector in Lake and Marshland Regions – A Case Study of Poyang Lake, Jiangxi Province, P.R. China

*T. Marié, H. Yésou, C. Huber et al.*

Risk Transmission Indicator of *Schistosomiasis Japonicum* Considering Human Activities in Lake and Marshland Regions – A Case Study of Poyang Lake, Jiangxi Province, P.R. China

*T. Marié, H. Yésou, C. Huber et al.*

## **Seismology – ID. 5305**

*Chairs: Sun Jianbao & Cécile Lasserre*

Monitoring Aseismic Slip Spatial and Temporal Behavior Along the Haiyuan Fault, Gansu, China  
*R. Jolivet, C. Lasserre, M.-P. Doin et al.*

## **Terrain Measurement – ID. 5297**

*Chairs: M. Liao & D. Perissin*

Terrain Measurement in the Dragon-2 Program

*M. Liao, L. Zhang, T. Balz et al.*

Terrain Monitoring in China via PS-QPS InSAR: Tibet and the Three Gorges Dam

*D. Perissin, Z. Wang, C. Prati & F. Rocca*

## **Sea Ice Detection – ID. 5290**

*Chairs: Y. Ji & W. Dierking*

Application of Envisat ASAR Data on Sea Ice Detection and Classification in Bohai Sea and Comparison to other Ice Regimes

*Y. Ji, W. Dierking, M. Similä et al.*

## **Lidar CAL/VAL – ID. 5291**

*Chairs: M. He & R. Van der A*

Summary of the Pre-Launch Validation Activities of the Wind-Lidar on ADM-Aeolus During the Dragon 2 Programme

*O. Reitebuch, C. Lemmerz, U. Marksteiner et al.*

## **3 Gorges – ID. 5343**

*Chairs: Q. Zeng & A. Singleton*

Monitoring Ground Surface Displacement in the Three Gorges Area, Dangxiong-Lhasa and Jiangsu Province Areas

*A. Singleton, J.-P. Muller, Q Zeng et al.*

## **Egomo ID. 5311**

*Chairs: Liu Yi & E. Kyrölä*

Exploitation of GOMOS, OSIRIS, OMI and MIPAS Measurements for Studying the Change in the Middle Atmosphere (EGOMO)

*E. Kyrölä, V. Sofieva, N. Kalakoski et al.*

## **Coal Fires –ID. 5345**

*Chairs: J. Li & C. Fischer*

Detection, Analysis and Risk Assessment of Coal Fires in Northern China

*C. Fischer, J. Li, J. Wu et al.*

## **AMFIC –ID. 5253**

*Chairs: P. Zhang & M. Menenti*

Satellite Remote Sensing Atmospheric Compositions and their Application in Air Quality Monitoring in China

*P. Zhang, X.Y. Zhang, W.G. Bai et al.*

Daily Emission Estimates in China Constrained by Satellite Observations

*B. Mijling & R.J. van der A*

## **POSTER SESSIONS**

### **Young Scientists**

*Chairs: G. Zhihai & A. Zmuda*

#### **Atmosphere**

Daily Emission Estimates in China Constrained by Satellite Observations

*B. Mijling & R. van der A*

Lidar Measurements for Deriving Atmospheric Temperature by Utilizing Rayleigh-Brillouin Scattering

*B. Witschas, O. Reitebuch, C. Lemmerz & U. Marksteiner*

Ozone Trend in the Troposphere and UTLS Region over Beijing from Ozone-sonde Measurements During 2002–2010

*Y. Wang, Y. Liu, H. Chen et al.*

Sampling Error in Atmospheric Satellite Measurements

*N. Kalakoski, V. Sofieva & E. Kyrölä*

#### **Forest Fires & Burn Scar Mapping**

A Semi-Automated Methodology for Burned Area Mapping Using HJ-CCD Data in China

*X. Zhu, X. Qin, F. Yang & B. Hu*

Automatic Extraction of Active Fire Line Using Landsat Imagery

*F. Yang, X. Qin, B. Hu et al.*

#### **Forest Mapping & Retrievals**

Change Analysis of SAR Based Growing Stock Volume Maps in Northeast China for 2005-2010

*I. Burjack, M. Santoro & C. Schmullius*

Creation of a Forest Dragon Geoportal for Validating Forest Growing Stock Volume Maps

*K. Traut, I. Burjack, J. Eberle et al.*

Regional Forest and Non-Forest Mapping with Envisat ASAR Data

*F. Ling, Z. Li, E. Chen et al.*



Single Baseline Tomography SAR for Forest Above Ground Biomass Estimation

*W. Li, E. Chen, Z. Li et al.*

A Method of Forest Type Classification Using PolInSAR Data

*X. Wang, E. Chen, Z. Li et al.*

## **Hydrology, Floods & Water Resources**

Water Extent Monitoring Exploiting MR and HR Remote Sensing Data:

Synergy, Constraints and Limits

*C. Huber, C. Uribe, X. Lai et al.*

Mapping and Monitoring the 2010 Flood Event in China: Case of Poyang Lake

*C. Huber, C. Uribe, X. Lai et al.*

Monitoring Flood Dynamic of the Yangtze Monsoon Lakes (PR China) Exploiting MR,  
HR and VHR CSK Data

*C. Huber, C. Uribe, J. Li et al.*

Calibration of an Energy Water Balance Model Using Satellite Data of Land Surface Temperature  
for the Upper Yangtze River Basin

*C. Corbari, M. Mancini, J. Li & B. Su*

Evaluation of Precipitation Products over Mountainous Watershed – A Case Study  
in the Heihe River Basin

*X. Pan & X. Li*

Impact of Soil Moisture Dynamics on ASAR Observed Backscatters and its Spatial  
Variability over the Upstream of the Heihe River Basin, China

*S. Wang*

Synergistic Use of AMSR-E and ASCAT Data for the Soil Moisture Retrieval  
over the Maqu Region

*L. Dente, P. Ferrazzoli, R. van der Velde et al.*

## **Land & Environment**

Method of National Vegetation Types Identification Based on the FY-3A MERSI Data

*B. Hu, X. Qin, F. Yang et al.*

From *Schistosomiasis* Vector Habitats Identification to Human Transmission Risk Mapping,  
in the Poyang Lake Area (Jiangxi Province, PR China)

*T. Marie, C. Huber & H. Yesou*

Area Estimations for Winter Wheat over the North China Plain Using a Sub-Pixel  
Classification Approach

*R. Van Hoolst, Q. Dong, H. Eerens et al.*

Medium Resolution Parameterisation of Turbulent Heat Fluxes over the Tibetan Plateau

*R. Faivre, J. Colin, H. Ghafarian & M. Menenti*

## **Methods**

Removal of Topography Effect on Radiometric Calibration Based on the Simulated SAR Image

*Q. Wang, Q. Zeng, J. Jiao & X. Zhou*

Direct Geolocation of TerraSAR-X Spotlight Mode Image and Error Correction

*X. Zhou, Q. Zeng, J. Jiao et al.*

Key Techniques of Flat-Earth Phase Removal Acceleration on the GPU

*S. Gao, Q. Zeng, J. Jiao et al.*

Research on Unification Methods of InSAR Phase Unwrapped Results in Isolated Regions

*S. Xiong, Q. Zeng, J. Jiao & X. Zhang*

## **Ocean Colour & Retrievals**

Relationship Between the Zhejiang Coastal Upwelling and Red Tides in the East China Sea

*X. Lou, A. Shi & Q. Xiao*

## **Ocean Mapping & Retrievals Using SAR**

Retrieval of 2D Sea Surface Current from ASAR Range Doppler Velocity

*M.W. Hansen, J.A. Johannessen & K.-F. Dagestad*

Oil Spill Monitoring in North Sea and Bohai Sea Using High Resolution X-Band SAR Imagery

*D. Velotto & S. Lehner*

Study on the Internal Wave Source in the South China Sea Based on Remote Sensing

*J. Wang, W. Huang, J. Yang & H. Zhang*

Coastal Wind Energy Assessment in the East China Sea with SAR Imagery

*X. Lou, J. Chang & A. Shi*

A Story of Typhoon: Typhoon Eye Observations Using SAR and FY-2

*Y. Pan, J. Yang & J. Wang*

A Parametric Method for Retrieving the Ocean Wave Spectra from SAR

*L. Ren & J. Yang*

The Simulation Study of Kelvin Ship Wake for SAR Imaging

*B. Gong, P. Chen & G. Zhang*

## **PolSAR**

Interactive Web Based Visualization of PS-InSAR and TomoSAR Results

*S. Li, L. Wei, T. Balz & M. Liao*

Generalized Wishart Mixtures for Unsupervised Classification of PolSAR Data

*L. Li, E. Chen & Z. Li*

Calibration of Compact Polarimetric Ground-Based SAR System

*L. Chen, J.-j. Zhang, Y. Li, W. Hong*

Feature Selection Method of Support Vector Machine for Polarimetric SAR  
Landcover Classification

*Q. Feng, E. Chen, Z. Li et al.*

## **Terrain Motion & DEMs Using SAR-1**

Landslide Monitoring in Three Gorges Area Using D-InSAR and PS-InSAR

*P. Tiantianuparp, X. Shi, M. Liao et al.*

Co-Seismic Rupture Mapping from SAR Amplitude Offset Tracking – A Case Study  
of the Mw 7.2 El Mayor-Cucapah Earthquake

*X. Hu, M. Liao, T. Wang & H. Jiang*

Creep Spatial and Temporal Evolution Revealed by InSAR Time Series Analysis

*R. Jolivet, C. Lasserre, M.-P. Doin et al.*

Analysis on Underground Coal Mining Subsidence Using Small Baseline  
InSAR in Yunjialing Mining Areas

*D. Yan, J. Yang & Q. Zeng*

A Comparison of Elevation Between InSAR DEM and Reference DEMs

*Y. Yun, Q. Zeng, J. Jiao et al.*

## **Urban & Environment**

High-Resolution TomoSAR & PS-InSAR Analysis in Urban Areas

*L. Wei, M. Liao, T. Balz et al.*

Joint Use of ALOS PalSAR and Landsat TM Images for Urban Change Detection

*J. Xu, L. Zhang, M. Liao & H. Wang*

Bidecadal Urban Land Cover and Ecosystem Service Changes in the Three Urbanized Regions

*J. Haas & Y. Ban*

Land Use/Land Cover Classification of Urban SAR Scenes: An Envisat/ASAR  
and HJ-1 Joint Approach

*M. Aldrighi, P. Gamba & G. Lisini*

## List of Participants

Chinese

European

## Photobook

### Additional Material

#### Ocean and Coastal zones

Comparison of Typical Wetlands Classification Accuracy in Yellow River Estuary Using Multi-Angle Proba CHRIS Hyperspectral Remote Sensing Images

*X. Wang, J. Zhang, Y. Ma & G. Ren*

Use of Earth Observation in Support of Major Sport Events: Case Study for the Athens, Beijing and London Olympic Games

*H. Gong, W. Zhao, X. Li et al.*

Coastline Remote Sensing Monitoring and Change Analysis of Bohai Bay from 2000 to 2010

*S. Ni, J. Zhang, Y. Ma & G. Ren*

LUCC Remote Sensing Monitoring of Yellow River Estuary Since the Last Diversion in 1996

*W. Sun, J. Zhang, Y. Ma & G. Ren*

Remote Sensing Inversion Algorithm of Suspended Particulate Matter Concentration by Using MERIS Satellite Data in the Yellow River Estuary

*Y. Hao, J. Zhang & T. Cui*

Feature Analysis of Ocean Waves in North Central Pacific Ocean Based ASAR Wave Spectral Data and Wave Model

*J. Wang, J. Zhang, J. Yang & J. Meng*

Comparison of MERIS and GOCI Ocean Color Product in the Yellow Sea of China

*P. Qin, Y. Shen, B. Mu et al.*

Remote Sensing Retrieval and Numerical Simulation for Suspended Particulate Matter in the Bohai Sea

*S. Qing, J. Zhang, T. Cui & Y. Bao*

Dynamic Distribution and Mechanism Analysis on the Ocean Colour Elements of Guangdong Coastal Water Based on MERIS Full-Resolution Remote Sensing Data

*W. Zhao, W. Cao, T. Cui et al.*

## Land Applications

*Schistosomiasis* Breeding Environment Situation Analysis in Dongting Lake Area

*C. Li, Y. Jia, L. Ma et al.*

Automatised Method for Active Fire Line Extraction Using Landsat Images

*F. Yang, X. Qin, B. Hu et al.*

Forest and Non-Forest Mapping with Envisat ASAR Images

*F. Ling, Z. Li, E. Chen et al.*

Interactive Web-Based Visualization of PS-InSAR and TomoSAR

*S. Li, L. Wei, T. Balz & M. Liao*

Generalized Wishart Mixtures for Unsupervised Classification of PoLSAR Data

*L. Li, E. Chen & Z. Li*

Single Baseline Tomography SAR for Forest Above Ground Biomass Estimation

*W. Li, E. Chen, Z. Li et al.*

A Method of Forest Type Classification Using PolInSAR Data

*X. Wang, E. Chen, Z. Li et al.*

Atmospheric Water Vapor Effects Removal of InSAR Interferogram in Southern California Region

*X. Cui, Q. Zeng, Q. Tong et al.*

Removal of Topographic Effect on Radiometric Calibration Based on the Simulated SAR Image

*Q. Wang, Q. Zeng, J. Jiao & X. Zhou*

Direct Geolocation of TerraSAR-X Spotlight Mode Image and Error Correction

*X. Zhou, Q. Zeng, J. Jiao et al.*

Key Techniques of Flat-Earth Phase Removal by Acceleration on the GPU

*S. Gao, Q. Zeng, J. Jiao et al.*

Research on Methods for Unifying Isolated Regions of InSAR Phase Unwrapped Results

*S. Xiong, X. Zhang, Q. Zeng & J. Jiao*

Analysis of the Relationship Between Displacement Field and Aftershocks of Tohoku-Oki Earthquake

*X. Zhang, Q. Zeng, J. Jiao et al.*

Feature Selection Method of Support Vector Machine for Polarimetric SAR Landcover Classification

*Q. Feng, E. Chen, Z. Li et al.*

Landslide Monitoring in Three Gorges Area Using D-InSAR and PS-InSAR

*P. Tiantianuparp, X. Shi, M. Liao et al.*

Co-Seismic Rupture Mapping from SAR Amplitude Offset Tracking – A Case Study of the Mw 7.2 El Mayor-Cucapah Earthquake

*X. Hu, M. Liao, T. Wang & H. Jiang*

Analysis on Underground Coal Mining Subsidence Using Small Baseline InSAR in Yunjialing Mining Areas

*D. Yan, Q. Zeng & J. Yang*

A Comparison of Elevation Between InSAR DEM and Reference DEMS

*Y. Yun, Q. Zeng, J. Jiao et al.*

High Resolution TomoSAR & PS-InSAR Analysis in Urban Areas

*L. Wei, M. Liao, T. Balz et al.*

Joint Use of ALOS PALSAR and Landsat TM Images for Urban Change Detection

*J. Xu, L. Zhang, M. Liao & H. Wang*

Remote Sensing of Bidecadal Urbanization and its Impact on Ecosystem Service in the Yangtze River Delta

*J. Haas & Y. Ban*

The Temporal and Spatial Distribution Characteristics of Heating Season and Source Tracing in Beijing

*H. Gong, W. Zhao, X. Li & W. Zhao*