

< Cover Sheet >
Researcher Profile

Principal Investigator, PI:

Name: Salvia, Maria Mercedes

Title: Investigadora Asistente (Junior Researcher) CONICET

Department: Remote Sensing Group

Organization: Instituto de Astronomía y Física del Espacio, (Institute for Astronomy and Space Physics, IAFE, CONICET-UBA)

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Co-Investigator, CI:

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<u>Haydee Karszenbaum</u>	IAFE	haydeek@iafe.uba.ar
<u>Francisco Grings</u>	IAFE	verderis@iafe.uba.ar
<u>Veronica Barraza</u>	IAFE	vbarraza@iafe.uba.ar
<u>Pablo Perna</u>	IAFE	pperna@iafe.uba.ar
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Biographical Information, Experience, Papers in Related Fields of Principal Applicant:

Mercedes Salvia is a Junior Researcher of CONICET (National Science Council), she obtained her PhD on June 2010, with the thesis “Aporte de la teledetección al estudio del funcionamiento del macrosistema Delta del Paraná: análisis de series de tiempo y eventos extremos” (Remote sensing of the functioning of Paraná River Delta wetland macrosystem: time series and extreme events analysis”. She has a great experience on satellite image processing and information extraction, both optical and active and passive microwaves images.

She is currently part of the following research projects:

1. “Condiciones hidrológicas de la planicie de inundación del corredor Paraná-Paraguay: aportes de los sistemas satelitales en microondas activas y pasivas”, CONAE (Pis: Mercedes Salvia and Pablo Perna, 2011-2013).
2. La Plata Basin floods and droughts: Contribution of microwave remote sensing in monitoring and prediction, Project granted as part of the **SACD-Aquarius NASA-CONAE science committee** (PI: H. Karszenbaum, 2010-2013).
3. “Polarimetric features of wetland environments”, Radarsat II, SOAR, CSA (2008-on), (data allocation).
4. “Evaluation of **ENVISAT/ASAR** alternating polarisation mode for determining the areal extent of standing water, its fluctuations and the related land cover units in the Delta of Parana river, Argentina”, Agencia Espacial Europea, ESA, (2003 - ongoing) (PI: H Karszenbaum).
5. “SMOS observations of La Plata Basin: analysis of products and their contribution to surface hydrology in Argentina”. This proposal is aimed at exploiting **SMOS** Level2-SM and L1C data in a large South American Basin, named De La Plata. In particular, the plans are: (1) to test the capability of SMOS Level2-SM data for improving the predictions made by atmospheric and hydrological models, (2) to use radiometric data for monitoring vegetation variables in a large forest, characterized by a variety of climatic conditions, (3) to improve prediction and monitoring of flooding events by L band radiometry (2006-ongoing) (PIs: H. Karszenbaum y J. Jacobo Berlles).

6. “Polarimetric features of wetland environments”, **Radarsat-2**, Agencia Especial Canadiense, CSI, (2009-ongoing).
7. Monitoring physiological status of wheat fields in Argentina, using a forward EM model and **COSMO SKyMed** data (2009-ongoing) (PI: H. Karszenbaum).
8. Multifrequency, multipolarization and multitemporal radar remote sensing of the Paraná River Wetland of Argentina: contribution of **COSMO-SkyMed** data (2009-ongoing) (PI: P. Kandus).
9. Soil moisture retrieval using **ALOS/PALSAR** data in Buenos Aires Province, Argentina: combining modeling, field work and data exploitation (2009-ongoing) (PI: H. Karszenbaum).
10. “Utilización de los sistemas satelitales SAC-C, Landsat-TM y MODIS en el monitoreo de las regiones de bosque nativo en Argentina” (ongoing) (IAFE, SAYDS, CONAE).

Papers in related fields:

- **Salvia, M., D. Ceballos, F. Grings, H. Karszenbaum, and P. Kandus.** 2012. “**Post-fire effects in wetland environment: landscape assessment of plant coverage and soil recovery in the Paraná River Delta marshes, Argentina**”. *Fire Ecology*, 8(2): 17-37. ISSN: 1933-9747
- F Grings, H. Karszenbaum, V. Douna; V. Barraza; **M. Salvia**; N.I. Gasparri; P. Ferrazzoli; R. Rahmoune. 2012. C band radiometric response to rainfall events in the subtropical Chaco forest. *IEEE GEOSCIENCE AND REMOTE SENSING LETTERS*. IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC. vol. 9, Nº. 2, p 209-213.
- **M. Salvia** , F. Grings , P. Ferrazzoli , V. Barraza, V. Douna , P. Perna, and H. Karszenbaum. 2011. “**Estimating flooded area and mean water level using active and passive microwaves: The example of Paraná River Delta floodplain**”. *Hydrol. Earth Syst. Sci.*, 15: 2679-2692. doi:10.5194/hess-15-2679-2011.
- **M. Salvia** , F. Grings , P. Ferrazzoli , V. Barraza, V. Douna , P. Perna, and H. Karszenbaum. 2011. “**Estimating flooded area and mean water level using active and passive microwaves: The example of Paraná River Delta floodplain**”. *Hydrol. Earth Syst. Sci. Discuss.*, 8, 2895 – 2928. doi:10.5194/hessd-8-2895-2011.
- **Salvia, M., Grings, F., Perna, P., Ferrazzoli, P., Rahmoune, R., Barber, M., Douna, V., Karszenbaum, H.** “**Monitoring flooded area fraction in floodplains of Paraná basin using passive and active microwave systems**” Presentación oral. International Geoscience and Remote Sensing Symposium (IGARSS) 2010. Julio 25-30. Honolulu, Hawaii. EEUU.
- P. Ferrazzoli; R. Rahmoune; F. Moccia; F. Grings, **M. Salvia**, M. Barber, H. Karszenbaum, A. Soldano, D. Goniadzki, G. Parmuchi, C. Montenegro, P. Kandus, M. Borro. “**The effect of rain and flooding events on AMSR-E signatures of La Plata Basin, Argentina**”. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*. Elsevier, 2010. vol. 3 n. 1 p.81-90 ISSN 1939-1404.
- **M. Salvia**, H. Karszenbaum, P. Kandus, F. Grings. “**Datos satelitales ópticos y de radar para el mapeo de ambientes en macrosistemas de humedal**”. *Revista de Teledetección*. ISSN: 1988-8740. 2009. 31: 35-51.
- **M. Salvia**, F. Grings, H. Karszenbaum, P. Ferrazzoli, P. Kandus, A. Soldano, L. Guerriero. “**Monitoring inundation dynamics in Paraná River, Argentina**”. *Proceedings of International Geoscience and Remote Sensing Symposium (IGARSS) 2008*, Boston. Massachussets, EEUU.
- Grings, F.M, **Salvia, M.**, Karszenbaum, H., Ferrazzoli, P., Perna, P, Barber, M., Jacobo Berlles, J. “**Statistical Information of ASAR observations over wetland areas: an interaction model interpretation**”. *ISPRS Journal of Photogrammetry and Remote Sensing*. Elsevier, 2010. vol. 65 p.77-85 ISSN 0924-2716.

Co-Investigators:

Haydee Harszenbaum

is a physicist and research member of Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), a remote sensing specialist, and Director of the Remote Sensing Group at the Instituto de Astronomía y Física del Espacio (IAFE), Buenos Aires, Argentina. Since 1983, she has worked in remote sensing, and since 1997, she has been dedicated to microwave remote sensing. She is currently the PI of national projects and of Space Agencies’ AO projects. She is also coordinating a technology transfer project related to applications and quality analysis of the future Argentine SAOCOM SAR mission products.

Papers in related fields:

- Salvia, M., D. Ceballos, F. Grings, H. Karszenbaum, and P. Kandus. 2012. “Post-fire effects in wetland environment: landscape assessment of plant coverage and soil recovery in the Paraná River Delta marshes, Argentina”. *Fire Ecology*, 8(2): 17-37. ISSN: 1933-9747
- F Grings, H. Karszenbaum, V. Douna; V. Barraza; **M. Salvia**; N.I. Gasparri; P. Ferrazzoli; R. Rahmoune. 2012. C band radiometric response to rainfall events in the subtropical Chaco forest. *IEEE GEOSCIENCE AND REMOTE SENSING LETTERS*. IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC. vol. 9, Nº. 2, p 209-213.

- SENSING LETTERS. IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC. vol. 9, N°. 2, p 209-213.
- M. Salvia , F. Grings , P. Ferrazzoli , V. Barraza, V. Douna , P. Perna, and H. Karszenbaum. 2011. “Estimating flooded area and mean water level using active and passive microwaves: The example of Paraná River Delta floodplain”. *Hydrol. Earth Syst. Sci.*, 15: 2679-2692. doi:10.5194/hess-15-2679-2011.
 - M. Salvia , F. Grings , P. Ferrazzoli , V. Barraza, V. Douna , P. Perna, and H. Karszenbaum. 2011. “Estimating flooded area and mean water level using active and passive microwaves: The example of Paraná River Delta floodplain”. *Hydrol. Earth Syst. Sci. Discuss.*, 8, 2895 – 2928. doi:10.5194/hessd-8-2895-2011.
 - Grings, F.M, Salvia, M., Karszenbaum, H., Ferrazzoli, P., Perna, P, Barber, M., Jacobo Berlles, J. “Statistical Information of ASAR observations over wetland areas: an interaction model interpretation”. *ISPRS Journal of Photogrammetry and Remote Sensing.* Elsevier, 2010. vol. 65 p.77-85 ISSN 0924-2716.
 - P. Ferrazzoli; R. Rahmoune; F. Moccia; F. Grings; M. Salvia; M. Barber; V. Douna; H. Karszenbaum; A. Soldano; D. Goniadzki; G. Parmuchi; C. Montenegro; P. Kandus; M. Borro. The effect of rain and flooding events on AMSR-E signatures of La Plata Basin, Argentina. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS).* Elsevier, VOL. 3, NO. 1, MARCH 2010, ISSN 1939-1404.
 - M. Salvia; M. Franco; F. Grings; P., Perna; H. Karszenbaum; P. Ferrazzoli. Estimating flow resistance of wetlands using SAR images and interaction models. *Remote Sens.* 2009, 1, 992-1008; doi:10.3390/rs1040992.
 - F. M. Grings, P. Ferrazzoli, M. Salvia, H. Karszenbaum, P. Kandus, Jacobo-Bberlles, Pablo Perna, 2008, “Model investigation about the potential of C band SAR in herbaceous wetlands flood monitoring”, *INTERNATIONAL JOURNAL OF REMOTE SENSING.* 2008. vol. 29 n. 17 p.5361-5372 ISSN 0143-1161, Taylor & Francis.

Francisco Grings

Francisco Grings is a Junior Researcher of CONICET (National Science Council), he obtained his PhD on 2008, with the thesis “Extracción de información biogeofísica a partir de imágenes satelitales, modelos de interacción y modelos de proceso” (Biogeophysical information extraction through satellite images, interaction models and process models). He has a great experience with electromagnetic scattering models and development of numeric simulations.

Papers in related fields:

- Salvia, M., D. Ceballos, F. Grings, H. Karszenbaum, and P. Kandus. 2012. “**Post-fire effects in wetland environment: landscape assessment of plant coverage and soil recovery in the Paraná River Delta marshes, Argentina**”. *Fire Ecology*, 8(2): 17-37. ISSN: 1933-9747
- F Grings, H. Karszenbaum, V. Douna; V. Barraza; M. Salvia; N.I. Gasparri; P. Ferrazzoli; R. Rahmoune. 2012. C band radiometric response to rainfall events in the subtropical Chaco forest. *IEEE GEOSCIENCE AND REMOTE SENSING LETTERS.* IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC. vol. 9, N°. 2, p 209-213.
- M. Salvia , F. Grings , P. Ferrazzoli , V. Barraza, V. Douna , P. Perna, and H. Karszenbaum. 2011. “**Estimating flooded area and mean water level using active and passive microwaves: The example of Paraná River Delta floodplain**”. *Hydrol. Earth Syst. Sci.*, 15: 2679-2692. doi:10.5194/hess-15-2679-2011.
- M. Salvia , F. Grings , P. Ferrazzoli , V. Barraza, V. Douna , P. Perna, and H. Karszenbaum. 2011. “**Estimating flooded area and mean water level using active and passive microwaves: The example of Paraná River Delta floodplain**”. *Hydrol. Earth Syst. Sci. Discuss.*, 8, 2895 – 2928. doi:10.5194/hessd-8-2895-2011.
- M. Salvia; F. Grings; P. Ferrazzoli; R. Rahmoune; M. Barber; H. Karszenbaum.; “**Monitoring flooded area fraction in floodplains of Paraná basin using passive and active microwave systems**”. 1° Congreso Internacional de Hidrología de Llanuras, 21-24 Septiembre, 2010, Azul, Buenos Aires, Argentina.
- Salvia, M., Grings, F., Perna, P., Ferrazzoli, P., Rahmoune, R., Barber, M., Douna, V., Karszenbaum, H. “**Monitoring flooded area fraction in floodplains of Paraná basin using passive and active microwave systems**” Presentación oral. *International Geoscience and Remote Sensing Symposium (IGARSS) 2010.* Julio 25-30. Honolulu, Hawaii. EEUU.
- P. Ferrazzoli; R. Rahmoune; F. Moccia; F. Grings, M. Salvia, M. Barber, H. Karszenbaum, A. Soldano, D. Goniadzki, G. Parmuchi, C. Montenegro, P. Kandus, M. Borro. “**The effect of rain and flooding events on AMSR-E signatures of La Plata Basin, Argentina**”. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing.* Elsevier, 2010. vol. 3 n. 1 p.81-90 ISSN 1939-1404.
- M. Salvia, H. Karszenbaum, P. Kandus, F. Grings. “**Datos satelitales ópticos y de radar para el mapeo de ambientes en macrosistemas de humedal**”. *Revista de Teledetección.* ISSN: 1988-8740. 2009. 31: 35-51.
- M. Salvia, F. Grings, H. Karszenbaum, P. Ferrazzoli, P. Kandus, A. Soldano, L. Guerriero. “**Monitoring inundation dynamics in Paraná River, Argentina**”. *Proceedings of International Geoscience and Remote Sensing Symposium (IGARSS) 2008,* Boston. Massachussets, EEUU.
- Grings, F.M, Salvia, M., Karszenbaum, H., Ferrazzoli, P., Perna, P, Barber, M., Jacobo Berlles, J. “**Statistical Information of ASAR observations over wetland areas: an interaction model interpretation**”. *ISPRS Journal of Photogrammetry and Remote Sensing.* Elsevier, 2010. vol. 65 p.77-85 ISSN 0924-2716.

Veronica Barraza Bernadas

Verónica Barraza Bernadas got her Bachelor degree on Biological Sciences from the Universidad Nacional de La Patagonia San Juan Bosco, on May 2009. She is currently working on her PhD thesis at IAFE Remote Sensing Group, being the person in charge of the GIS and cartography related software.

Papers in related fields:

- FRANCISCO GRINGS, H. KARSZENBAUM; VANESA DOUNA; VERONICA BARRAZA; MERCEDES SALVIA; HAYDEE KARSZENBAUM; NESTOR IGNACIO GASPARRI; PAOLO FERRAZZOLI; RACHID RAHMOUNE. 2012. C band radiometric response to rainfall events in the subtropical Chaco forest. IEEE GEOSCIENCE AND REMOTE SENSING LETTERS. IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC. vol. 9, Nº. 2, p 209-213.
- MERCEDES SALVIA; FRANCISCO MATÍAS GRINGS; PAOLO FERRAZZOLI; VERONICA BARRAZA; VANESA DOUNA; PABLO PERNA; HAYDEE KARSZENBAUM 2011. Estimating flooded area and mean water level using active and passive microwaves: the example of Parana River Delta floodplain. HYDROLOGY AND EARTH SYSTEM SCIENCES, COPERNICUS PUBLICATIONS. 8 :2895 - 2928.

Pablo Perna

Pablo Perna earned his title as University Computing at the University of Buenos Aires on 2008, and is currently finishing his Bachelor thesis “Simulación de Sistemas de Radar Orbitales y Aerotransportados” (Simulation of orbital and airborne SAR systems). Since 2005, his main developed tasks on the Remote Sensing Group of IAFE include software development for system simulation models of microwave satellite observations, development of instruments for field work automation and computer support for developments in remote sensing models, actively collaborating in the design and development of a laser bidimensional profilometer for the measurement of soil roughness.

Papers in related fields:

- M. Salvia , F. Grings , P. Ferrazzoli , V. Barraza, V. Douna , P. Perna, and H. Karszenbaum. 2011. “**Estimating flooded area and mean water level using active and passive microwaves: The example of Paraná River Delta floodplain**”. Hydrol. Earth Syst. Sci, 15: 2679-2692. doi:10.5194/hess-15-2679-2011.
- M. Salvia , F. Grings , P. Ferrazzoli , V. Barraza, V. Douna , P. Perna, and H. Karszenbaum. 2011. “Estimating flooded area and mean water level using active and passive microwaves: The example of Paraná River Delta floodplain”. Hydrol. Earth Syst. Sci. Discuss., 8, 2895 – 2928. doi:10.5194/hessd-8-2895-2011.
- Francisco Matias Grings; Mercedes Salvia; Haydee Karszenbaum; Paolo Ferrazzoli; Pablo Perna; Matias Barber; Julio Cesar Jacobo-Berlles. Statistical Information of ASAR observations over wetland areas: an interaction model interpretation. *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*. Elsevier, 2010. vol. 65 p.77-85 ISSN 0924-2716
- Francisco Matias Grings; Mercedes Salvia; Haydee Karszenbaum; Paolo Ferrazzoli; Patricia Kandus; Pablo Perna. Advances in radar remote sensing of wetland ecosystems: Combination of satellite observations, field data and em Models. *JOURNAL OF ENVIRONMENTAL MANAGEMENT*. Elsevier, 2009. vol. 90 p.2189-2198 ISSN 0301-4797
- Mercedes Salvia; Mariano Franco; Francisco Matias Grings; Pablo Perna; Haydee Karszenbaum; Paolo Ferrazzoli. Estimating flow resistance of wetlands using SAR images and interaction models. *Remote Sensing*. mpdi.com, 2009. vol. 1 p.992-1008 ISSN 2072-4292
- Francisco Matias Grings; Paolo Ferrazzoli; Haydee Karszenbaum; Mercedes Salvia; Patricia Kandus; Julio Cesar Jacobo-Berlles; Pablo Perna. Model investigation about the potential of C band SAR in herbaceous wetlands flood monitoring. *INTERNATIONAL JOURNAL OF REMOTE SENSING*. Taylor & Francis, 2008. vol. 29 n. 17 p.5361-5372 ISSN 0143-1161



Signature of principal applicant:

Date: 31 October 2012

Form 2 Information of Proposal Contents

1. Research Category (check one)*

Calibration and Validation: Sensor calibration Validation of geophysical parameters

Utilization and Scientific Researches: Disaster and earthquake Land-use and land-cover research

Vegetation, forestry and wetland Agriculture Geography Geology

Hydrology Snow and ice Polar research Oceanography and coastal zone

Resources related research Climate and weather Polarimetry and interferometry

Education Others

* Our priority for the proposal selection will not be judged from your selected category.

2. Main Sensor (check one or more)

PALSAR-2 None

3. Supplemental Sensor (check one or more)

PALSAR AVNIR-2 PRISM JERS-1/SAR JERS-1/OPS None

4. Research Title:

Satellite estimation of flooded area and river water level dynamics: development of multisensor strategies.

5. Abstract of Proposal: (within 600 words)

This Project proposes developments on passive and active microwave remote sensing field, in order to obtain ecohydrological information that is highly relevant for management and forecast activities of the La Plata Basin. Specifically, we aim to obtain flooded area maps at regional scale for fluvial wetlands of the La Plata Basin, and to determine an empiric relation between hydrometric level at several portions of the Parana River and the flooded area fraction on adjacent floodplains, in order to assess regular and extreme flooding event dynamics on that basin.

The knowledge of the dynamics and temporal fluctuations of flooded area on the different floodplains of de La Plata Basin constitutes essential information for early flooding/drought alert systems and for environmental assessment models in general, including global change models.

The general aim of this project is to analyze the relation between flooded area fraction on the floodplain and river water level for areas of the basin that show the same hydrodynamic behavior using data from different satellite sensors, so that this information contributes with valid information in the improvement of hydrological models and anthropic activity effect assessment models.

The specific objectives of this project are:

- To develop a methodology that generates flooded area maps using passive microwaves. This methodology will be based on the development of algorithms, interaction models and other satellite data and field data.
- To develop a methodology to calibrate and validate the maps obtained from passive microwave sensors (low spatial resolution) using SAR data with higher spatial resolution.
- To study the relation between flooded area fraction and hydrometric water level data for different ecohydrological units on the Parana-Paraguay axis floodplains.
- To construct an effective topography schematic for each analyzed ecohydrological units, based on the results of the previous item.
- Using the effective topography schematics, to analyze the possibility of predicting flooding events dynamics from hydrometric data and auxiliary information.

The methodology will be based on Sippel et al. (1998) and Hamilton et al. (2002) for passive microwave and on change detection through image difference for SAR.

The anticipated results are:

- SAR based flooded area maps for the Parana-Paraguay axis floodplain at regular intervals (approximately one a month)
- Passive microwave based fraction of flooded area maps for the Parana-Paraguay axis floodplain at regular intervals (approximately two every week)

Effective topography schematics (like the one in figure 2) that relate water level in the river with the fraction of flooded area in the floodplain for each identified ecohydrological unit

6. Research Schedule

The foreseen tasks will be the following:

1. Selection and download of passive microwave (AMSRE, WindSat, SMOS, SACD-Aquarius), SAR (ALOS PALSAR 2, Cosmo Skymed), optical (MODIS) and altimeter (ERS-1, ERS-2, Topex/Poseidon, Jason) data.
2. Preliminary definition of ecohydrological units of the floodplain, based on existing regionalization and analysis of past flooding events. Each unit will be defined as the contiguous floodplain area that has the same source (river or creek) of flooding.
3. Recompilation of rainfall and river water level data. Assembling of a Geographic Information System (GIS)
4. Construction of a data base that includes water level height and flow of water in the river, accumulated daily rainfall, mean maximum temperature, mean minimum temperature and air relative humidity, for every ecohydrological unit of the floodplain.
5. Satellite data preprocessing
6. Calibration, geometric correction (including georeference) and index calculation when appropriate.
7. Developing and implementation of flooded area retrieval strategies based on equation 5. Different strategies based on interaction models, bibliography data and ad hoc information gathered during fieldwork will be tested.
8. Validation of the flooded area retrieval using SAR images.
9. Identification of flow dynamics of the flood / drought cycle in the floodplains of the Paraná River, Argentina (flood wave).
10. Analysis of monthly, seasonal, annual and interannual variability of flooding patterns of the Parana River. Interpretation through auxiliary environmental data.
11. Determining fractions of surface open water, flooded and nonflooded area as a function of time from passive microwave data. Validation through medium resolution optical (MODIS) and SAR data (ALOS PALSAR2- Cosmo Skymed)
12. Analysis of the correlation between flooded area and river water level, based on methodology developed in Sippel et al. (1998), Hamilton et al. (2002) and methodology developed in this project. Interpretation through auxiliary environmental data.
13. Assembling of a spatial-temporal database with the obtained results.

	1 st Semester	2 nd Semester	3 rd Semester	4 th Semester
1	x		x	
2			x	
3	x	x		
4	x	x	x	
5	x		x	
6	x		x	
7	x	x	x	x
8	x	x	x	x
9		x	x	x
10			x	x
11		x	x	x
12		x	x	x
13				x

7. Request form for JAXA archived data (Form 2a)

Satellite/ sensor	Region of interest (Path-Row/lat-lon)	Season	Process level	No. of scenes
ALOS PALSAR	path 403 row 250	summer, autumn, winter, spring	1.5 polarization: HH	FEB-20-2007 JAN-08-2008 JUL-10-2008 OCT-10-2008 FEB-25-2009
ALOS PALSAR	path 403 row 300	summer, autumn, winter, spring	1.5 polarization: HH	FEB-20-2007 JAN-08-2008 JUL-10-2008 OCT-10-2008 FEB-25-2009
ALOS PALSAR	path 402 row 250	summer, autumn, winter, spring	1.5 polarization: HH	MAY-08-2008 JUN-23-2008 AUG-08-2008 NOV-08-2008
ALOS PALSAR	path 402 row 300	summer, autumn, winter, spring	1.5 polarization: HH	MAY-08-2008 JUN-23-2008 AUG-08-2008 NOV-08-2008

* Detailed data ordering and provision procedure will be informed by JAXA.

8. Data order form for ALOS-2/PALSAR-2 (Form 2b)

Satellite/ sensor	Region of interest (Path-Row/lat-lon)	Season	Process level	No. of scenes
ALOS-2 PALSAR-2	path 403 row 250	summer, autumn, winter, spring	1.5 polarization: HH	36 (once a month for 3 years)
ALOS-2 PALSAR-2	path 403 row 300	summer, autumn, winter, spring	1.5 polarization: HH	36 (once a month for 3 years)
ALOS-2 PALSAR-2	path 402 row 250	summer, autumn, winter, spring	1.5 polarization: HH	36 (once a month for 3 years)
ALOS-2 PALSAR-2	path 402 row 300	summer, autumn, winter, spring	1.5 polarization: HH	36 (once a month for 3 years)

* Detailed data ordering and provision procedure will be informed by JAXA.

Kazuo Tachi
Director
Program Management and Integration Department
Space Applications Mission Directorate
Japan Aerospace Exploration Agency (JAXA)
2-1-1 Sengen, Tsukuba-shi, Ibaraki 305-8505, JAPAN

**Application Form
For
Research Agreement
For
the Advanced Land Observing Satellite-2
between
the Japan Aerospace Exploration Agency and
the Research Organization (for the fourth RA)**

Dear Mr. Tachi:

We have read and agree to comply with all the terms and conditions of the “Research Agreement for the Advanced Land Observing Satellite-2 between the Japan Aerospace Exploration Agency and the Research Organization (for the fourth RA)” and apply for conclusion of the Agreement.

Principal Investigator:

Name: Salvia, Maria Mercedes
Title: Investigadora Asistente (Junior Researcher) CONICET
Department: Remote Sensing Group
Organization: Instituto de Astronomía y Física del Espacio, (Institute for Astronomy and Space Physics, IAFE, CONICET-UBA)
Address: Intendente Güiraldes 2160, Pabellón IAFE, Ciudad Universitaria, Ciudad de Buenos Aires, Argentina
Country: Argentina
E-mail: msalvia@iafe.uba.ar, mercedes@teledeteccion.com.ar
Telephone: (+5411) 47890179 ext 226 Facsimile: (+5411) 47868114

PI Number: _____(Leave blank for JAXA use)

Research Title:

Satellite estimation of flooded area and water level dynamics: development of multisensor strategies.

RO Contact Point for Contract Matters (Please fill in if there is a contact point other than PI):

Name: _____
Department: _____
Organization: _____
Address: _____
Country: _____ E-mail: _____
Telephone: _____ Facsimile: _____

Co-Investigators: Attachment

*Signature of Authorized Personnel at RO
Name and Title of Authorized Personnel
Name of Research Organization

*Signature of the person duly authorized to conclude the research agreement on behalf of the RO

PI No. _____
(Leave blank for JAXA use)

List of Co-Investigators

Co-Investigators

Name	Organization	E-mail
<u>Haydee Karszenbaum</u>	IAFE	haydeek@iafe.uba.ar
<u>Paolo Ferrazoli</u>	Tor Vergata	ferrazzoli@disp.uniroma2.it
<u>Francisco Grings</u>	IAFE	verderis@iafe.uba.ar
<u>Veronica Barraza</u>	IAFE	vbarraza@iafe.uba.ar
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