

# Updates on INPE's contributions for CEOS (GEO) activities

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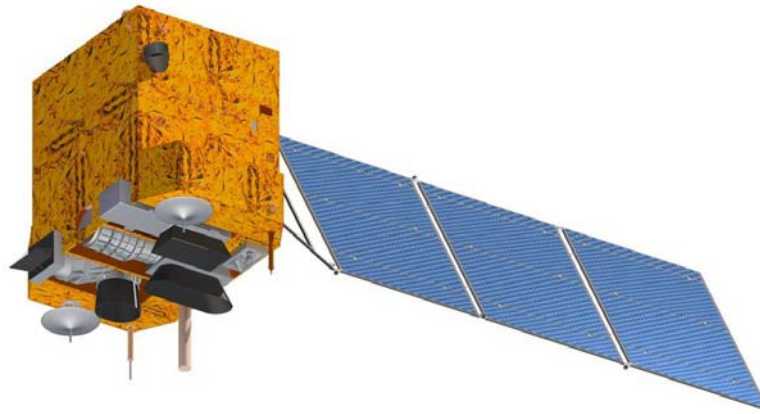
# INPE's participation in CEOS and GEO activities is mostly related to CBERS Program

- LSI constellation
- GEO Capacity Building
- GEO Forest Carbon Tracking
- WGCV
- WGISS

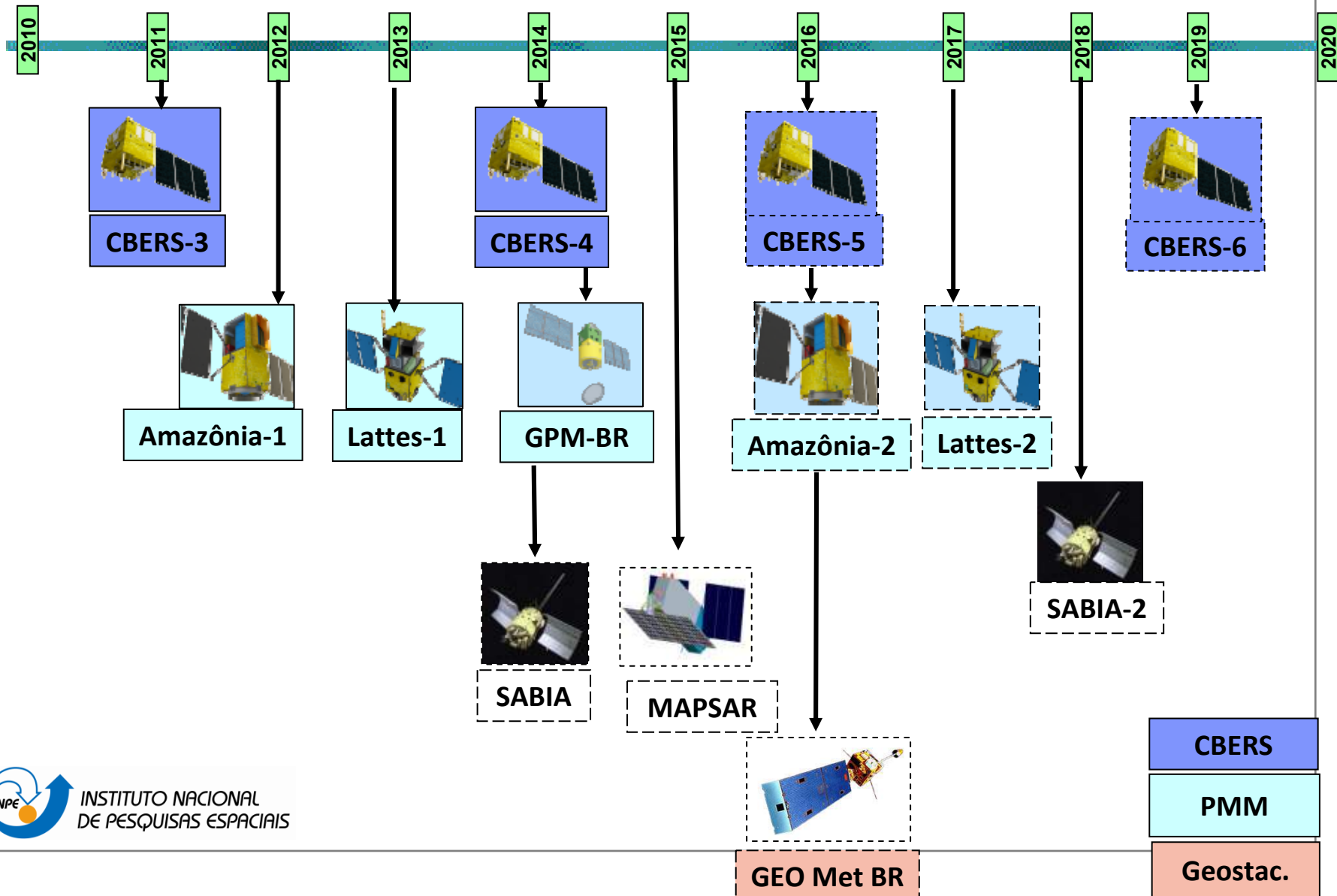


Multilateral agreements have been promoted

# EO satellite program for 2010 – 2020



# Brazilian Satellites: 2010-2020



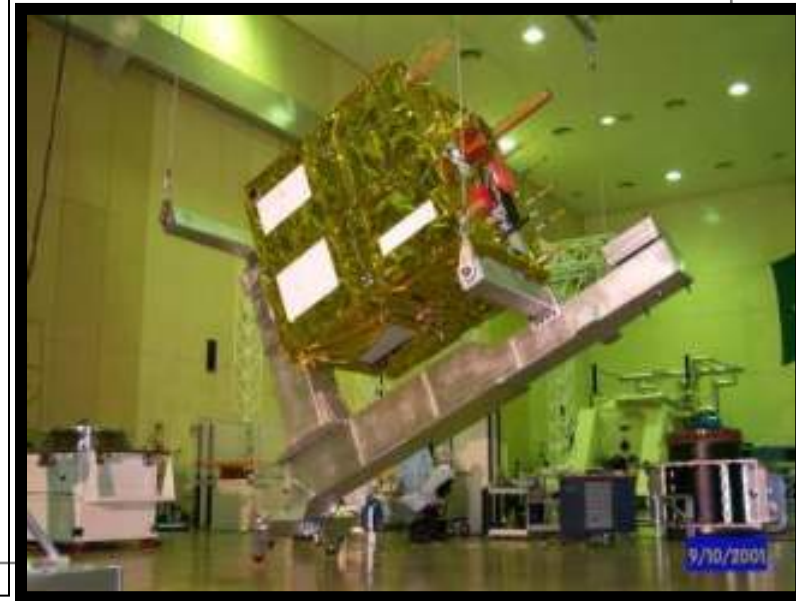
# CBERS-1, 2, 2B work share (70% China, 30% Brazil)

## Service Module

Structure	Brasil
Thermal Control	China
Attitude and Orbit Control	China
Power supply	Brasil
On-board computer	China
Telemetry	Brasil

## Payload Module

CCD	China
IRMSS	China
WFI	Brasil
Data Transmission	China
Data collection	Brasil



# CBERS 3&4 China-Brazil Work Share (50% China, 50% Brazil)

China	Brazil
TCS - Thermal Control	Structure
AOCS - Attitude Control *	EPSS - Electrical Power Supply
OBDH - Onboard Data Handling *	TTCS – Service Telecommunications
SCS - System Circuitry	MUX camera (20m)
PAN camera (5m)	WFI-2 camera (73m)
IRS camera (40m)	DDR – Data Recorder
SEM – Space Environment	DCS – Data Collecting
PIT – Data Transmitter	MWT – Data Transmitter

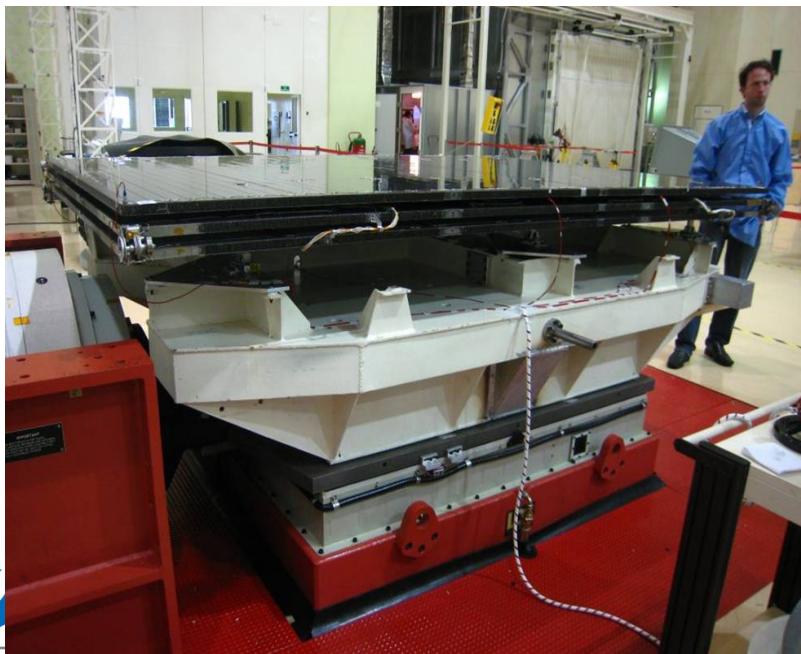
## CBERS-3 and 4 payload equipment

Payload	Geometric Resolution	Spectral Bands	Swath Width	Revisit
<b>PAN Camera</b>	5 m 10 m	PAN G, R, NIR	60 km, lateral view 32°	52 days
<b>MUX Camera</b>	20 m	B, G, R, NIR	120 km	26 days
<b>IRS Camera</b>	40 m 80 m	PAN, SW, MIR TIR	120 km	26 days
<b>WFI Camera</b>	73 m	B, G, R, NIR	866 km	5 days
<b>DCS</b>	Data Collecting Subsystem			
<b>SEM</b>	Space Environment Monitor			



## CBERS-3 e 4 development status

- System CDR (Critical Design Review) conducted early February 2010 in Brazil
- CBERS 3 launch in September, 2011
- CBERS 4 launch in April, 2014



**CBERS 3&4 – SAG Vibration test**



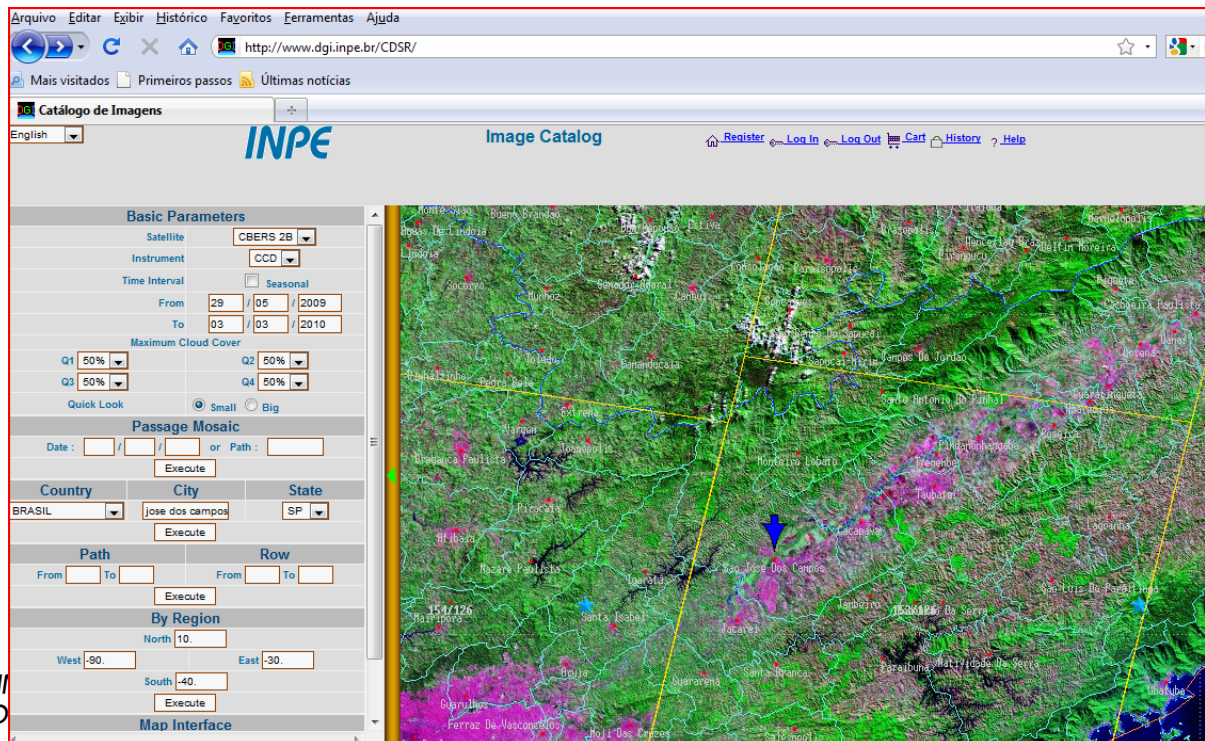
**CBERS 3&4 – TM test**



# CBERS (free) data policy continues...

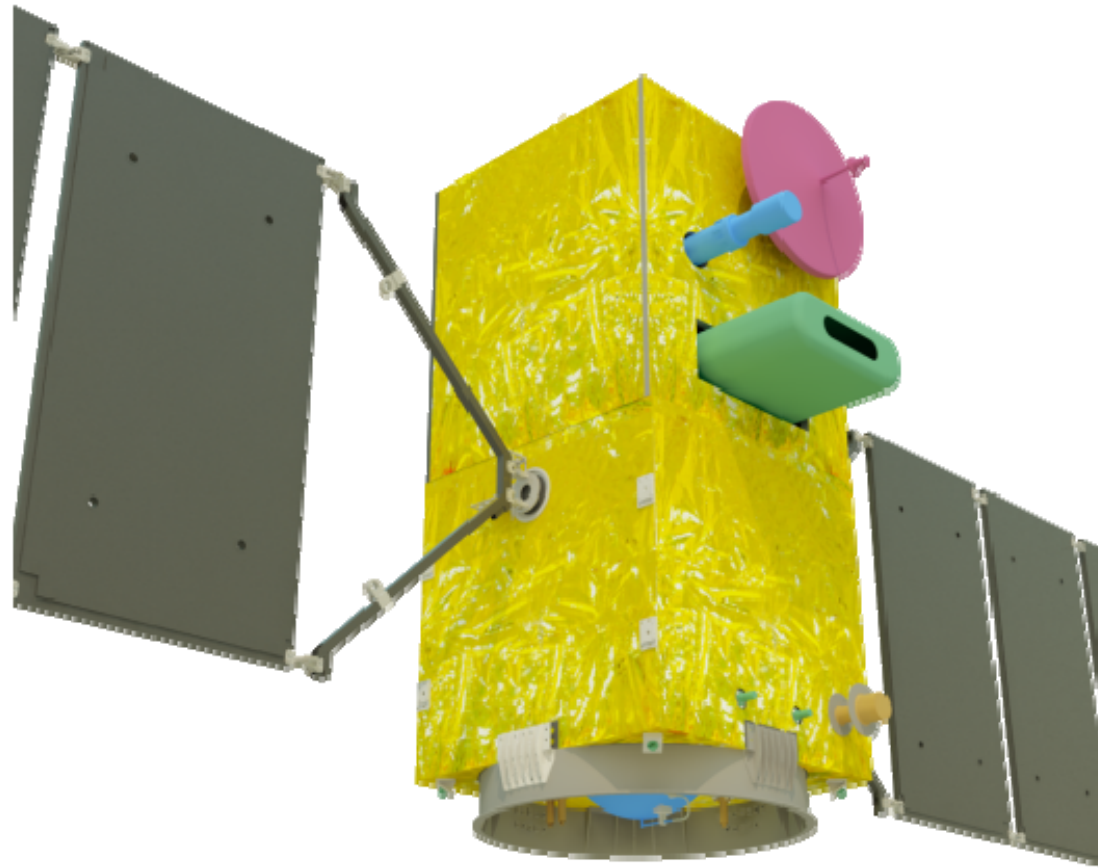
Data acquired over Brazil are available free of charges to anyone

Brazil applies the same policy for any country



WGCV-31, Potomac

# AMAZÔNIA Mission



Providing images to accomplish projects in the Amazon region: PRODES, DETER, DEGRAD, ...

# AMAZÔNIA-1 Payload

	<b>AWFI</b>
<b>Spectral Bands (μm)</b>	<b>0,45-0,52 B</b> <b>0,52-0,59 G</b> <b>0,63-0,69 R</b> <b>0,77-0,89 NIR</b>
<b>Resolution (m)</b>	<b>40</b>
<b>Swath width (km)</b>	<b>700</b>
<b>Revisit (days)</b>	<b>5</b>

- Global coverage every two days together with CBERS-3

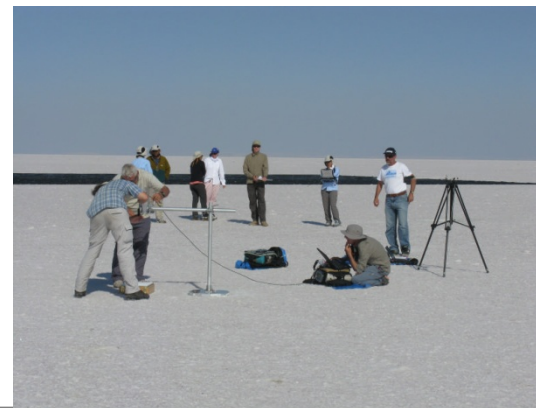
# ResourceSat-1 (IRS-P6)

Indian Space Research Organization (ISRO)

- Since 09/15/2009, INPE is receiving and processing ResourceSat-1 imagery:
  - LISS-3 (23 m) and AWIFS (55 m)
  - LISS-4 (5 m) is not included
- The images cover South America region in the range of INPE's reception antenna in Cuiaba - MT (Brazil)
- Images are costless distributed in the catalog(<http://www.dgi.inpe.br/CDSR/>)

# CEOS Campaign on Tuz Gölü test site (Aug. 2009)

- INPE (Flavio Ponzoni) participated as an observer
- Special thanks to Nigel Fox for the invitation
- We expect INPE has an effective participation in the next missions
- Flavio Ponzoni has already registered to participate in the **CEOS comparison of Land surface reflectance AUG 2010**



WGCV-31, Potomac

# GEO Capacity Building

- Free and open-source software
  - SPRING ([www.dpi.inpe.br/spring](http://www.dpi.inpe.br/spring))
  - TerraLib ([www.dpi.inpe.br/terralib](http://www.dpi.inpe.br/terralib))
  - TerraView ([www.dpi.inpe.br/terraview](http://www.dpi.inpe.br/terraview))
  - Sismaden ([www.dpi.inpe.br/sismaden](http://www.dpi.inpe.br/sismaden))
  - Marlin ([www.dgi.inpe.br/CDSR](http://www.dgi.inpe.br/CDSR))
- Dissemination of free CBERS data for African countries

# Capacity Building TASK-CB-09-05B

- Establish and upgrade the capacity of ground stations with a footprint in Africa to receive, process, store and distribute CBERS (China-Brazil Earth Resources Satellite) images.
- Possible ground stations : Maspalomas, operated by INTA (Spain), and Hartebeeshoek, operated by CSIR (South Africa), Aswan, operated by NARSS (Egypt), where CBERS reception tests were successfully performed, and Malindi in Kenya, operated by ASI (Italy).
- Brazilian and French (CNES and IRD) delegations conducted a field survey in Libreville (Gabon), to define an appropriate location for a future antenna for the reception of CBERS satellites.
- Perspectives for 2010:
  - Finalize tests with image catalogue in Maspalomas and make data publicly available on the Internet.
  - Hartebeeshoek and Aswan ground stations should be fully operational



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Thanks!