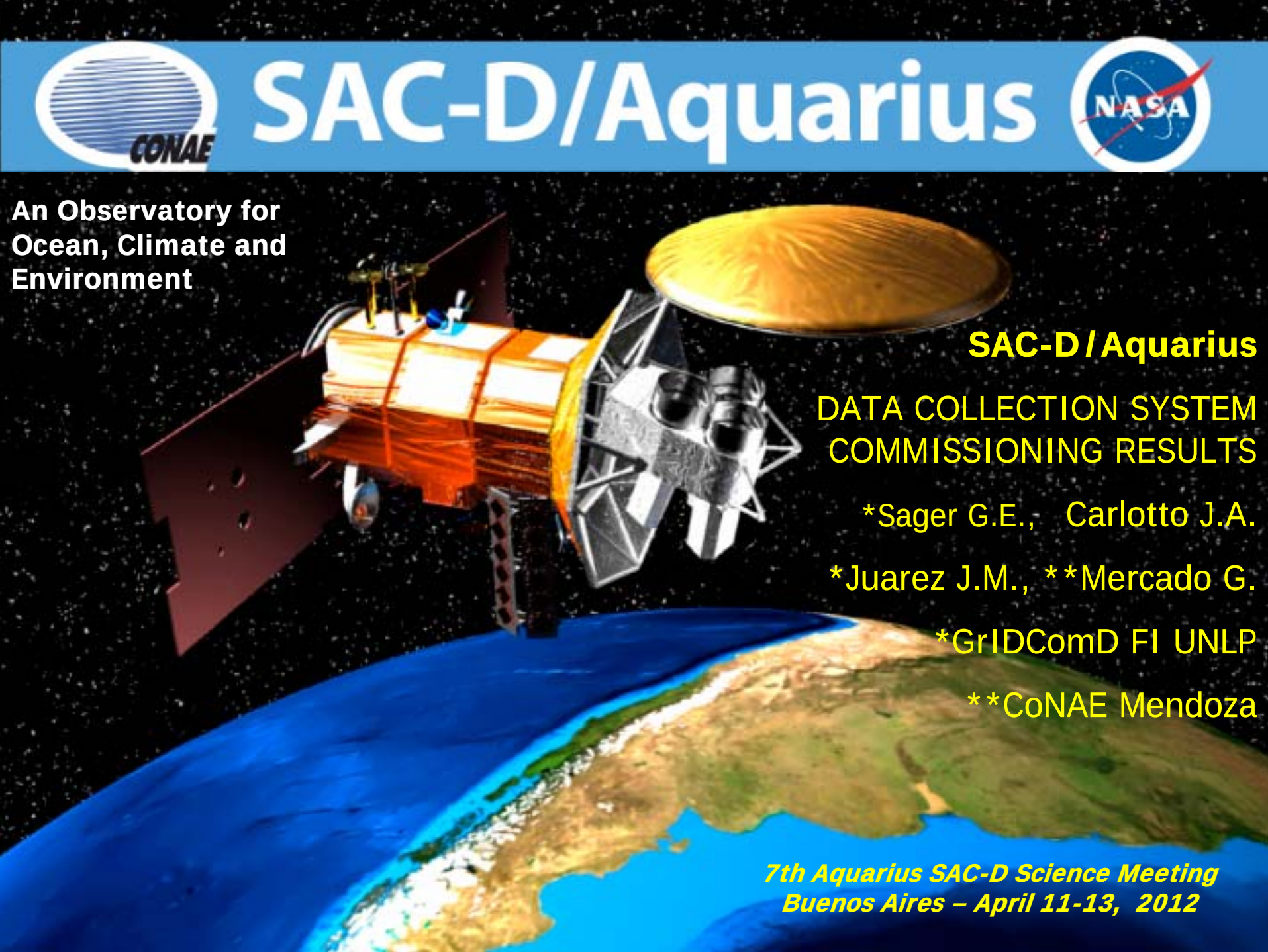
SAC-D/Aquarius

An Observatory for Ocean, Climate and Environment



SAC-D / Aquarius

DATA COLLECTION SYSTEM COMMISSIONING RESULTS

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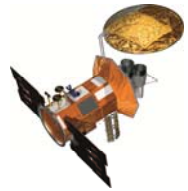
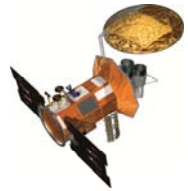
7th Aquarius SAC-D Science Meeting
Buenos Aires – April 11-13, 2012



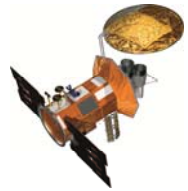
Performed Activities

- **Initial Turn On**
- **Tframe Acquisitions (Nominal Frequency & Adjacent Channels)**
- **Threshold adjustement (Nominal, ARGOS & Brazil Frequencies)**



Initial Turn On (ITO)

- **During ITO, several tests were performed:**
- **DCS was commanded to change operation mode, while TMTY was monitored.**
- **DCS was comanded to take raw data (TFrames) intended to assess Channel Noise level at different AGC settings: Maximum Gain, Minimum Gain and Normal (automatic) gain while no signal was transmited from UNLP.**
- **DCS works as expected during all the modes and AGC changes.**
- **DCS Initial Turn On was successful.**



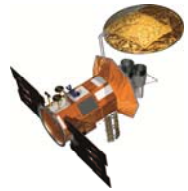
TFrame Acquisition

- **Takes several Tframes during pass.**
- **Intended to analyze doppler frequency and power received.**
- **First pass from AOS to Max elevation**
- **Second pass from Max elevation to LOS**
- **Third and fourth pass covering all pass at lower and upper adjacent channel**

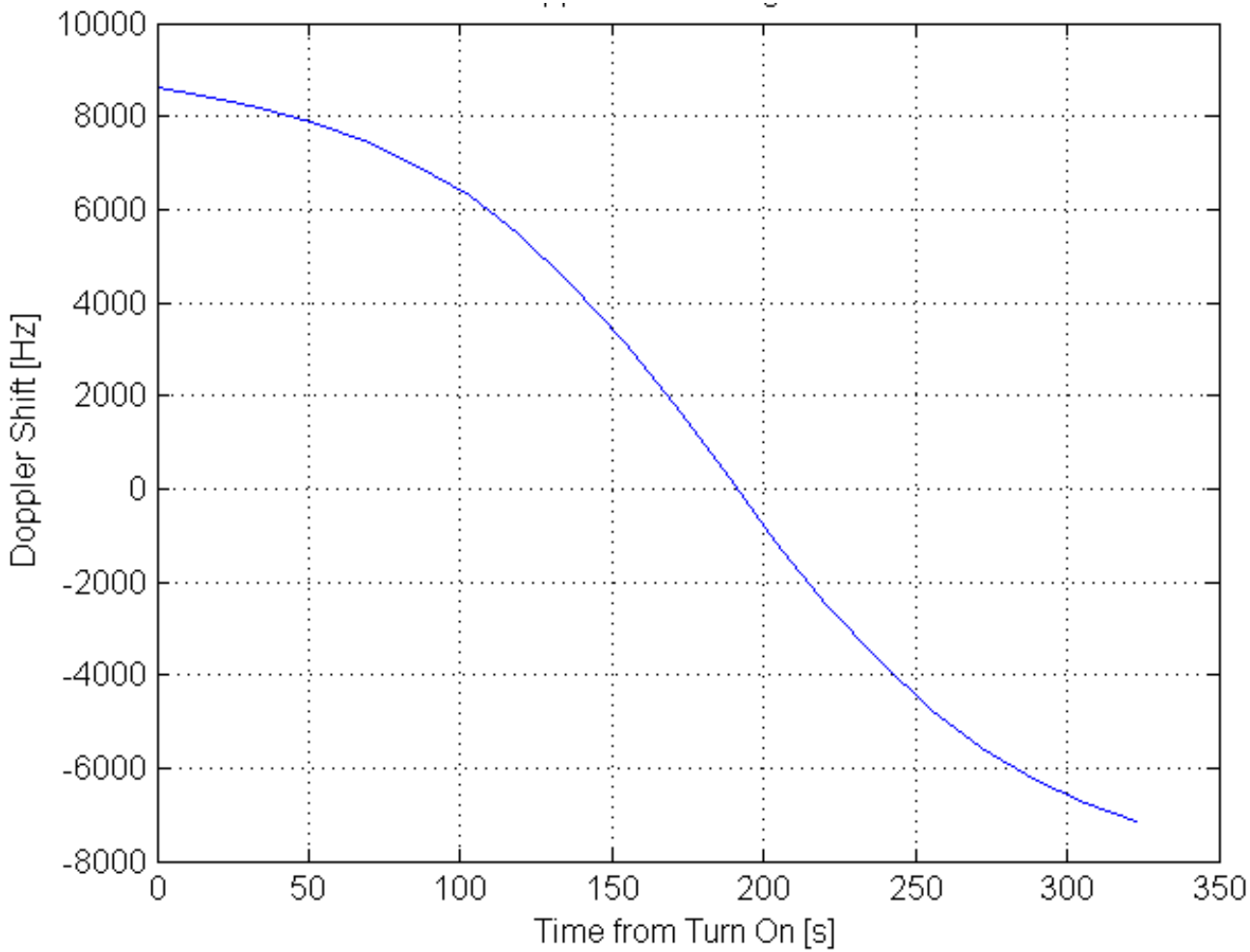
TFrame Acquisition @ Lower Adjacent Nominal Channel

Initial Position

End Position

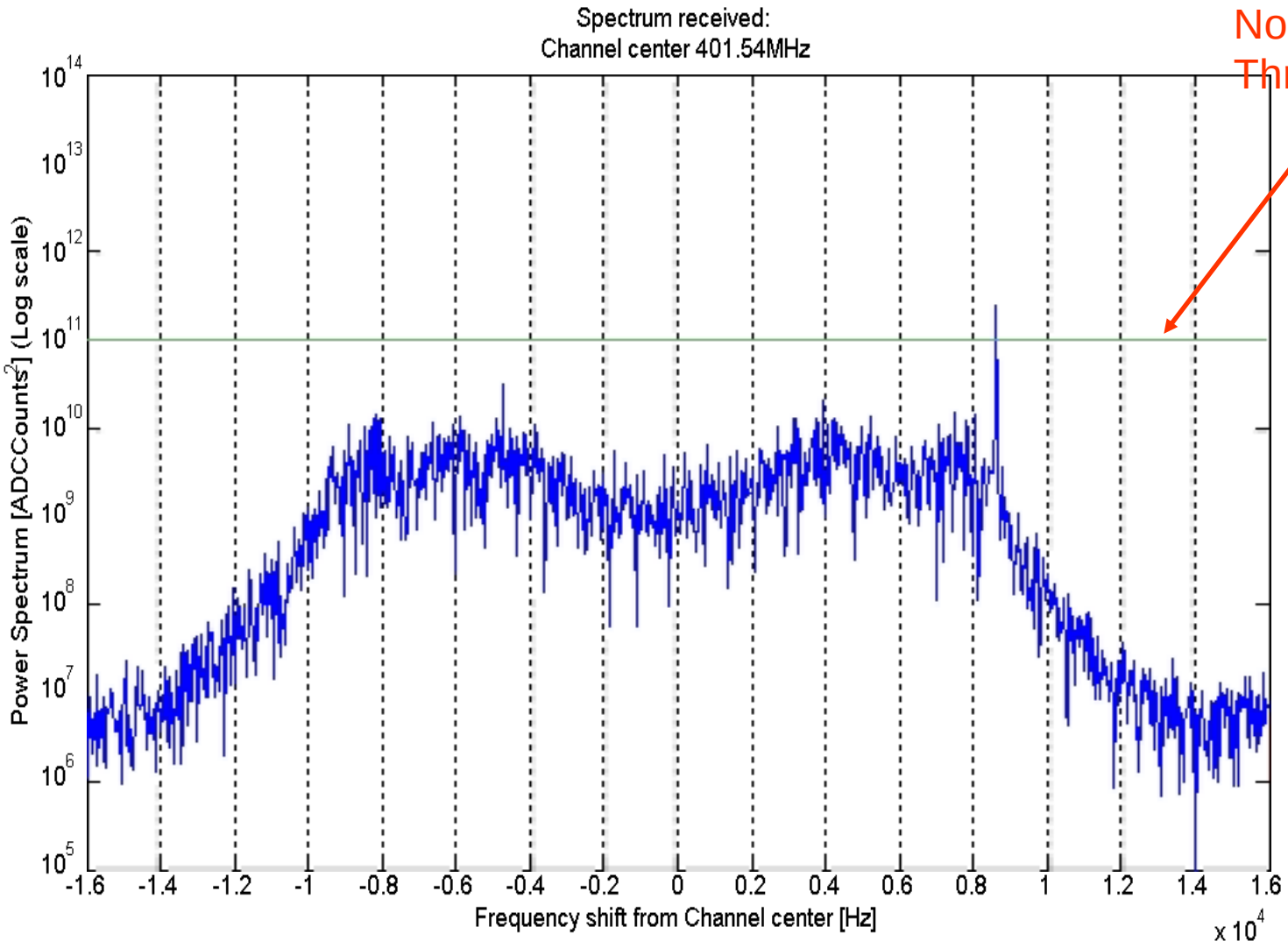


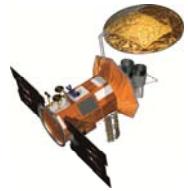
Doppler Shift from Tframes Acquisition



Power Spectrum

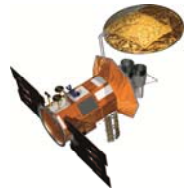
(Click over figure to start video)





Threshold adjustement at Nominal Frequency

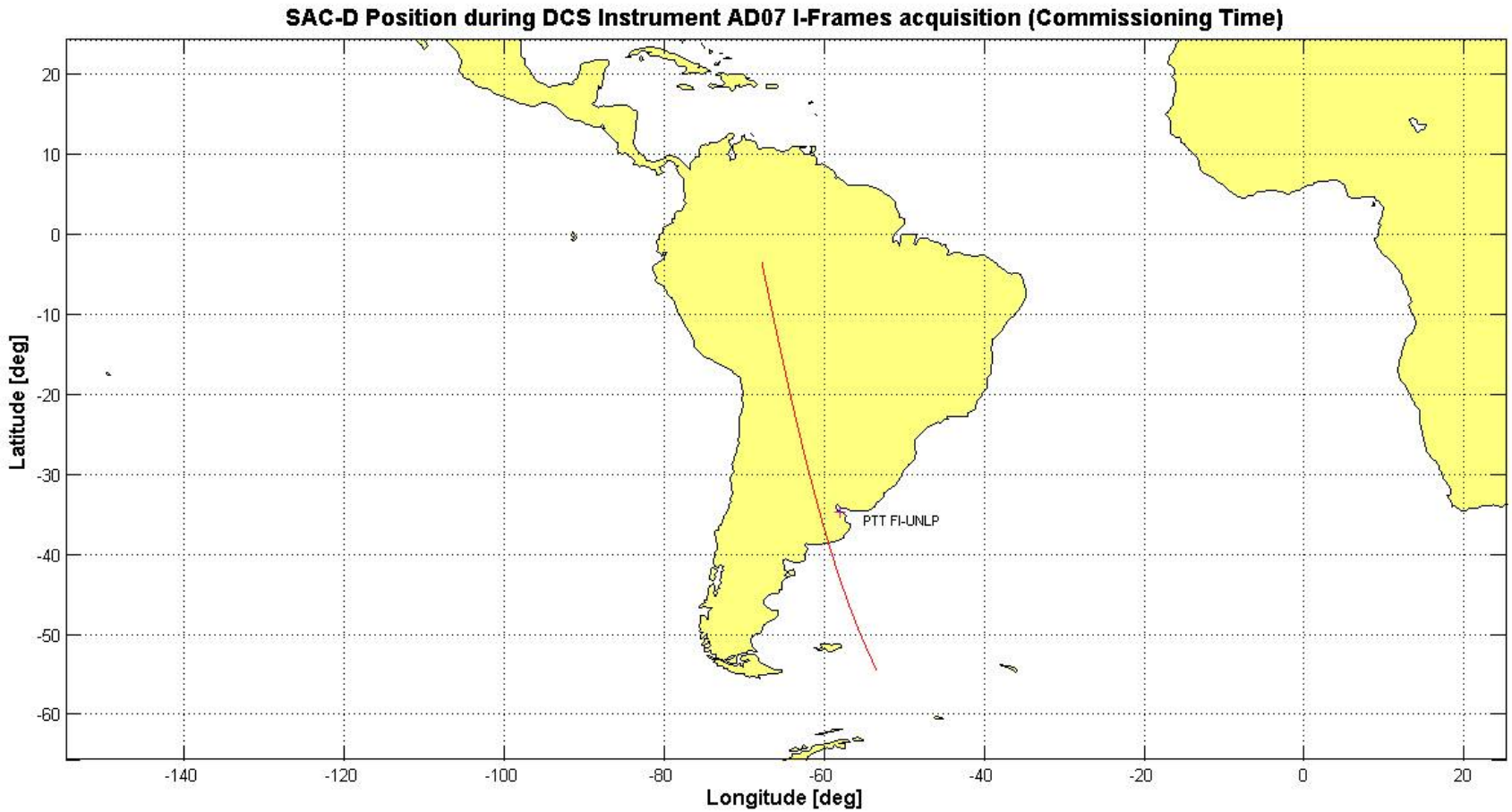
- **DCP Fixed Data Transmission from Universidad de La Plata with different DCS threshold settings.**
- **Transmission were repeated with a 2 sec Interval between them to emulate many platforms (No collisions)**
- **Thresholds from 207 to 204 (Nominal Threshold) tested.**
- **The goal is to use minimum possible threshold.**
- **If threshold is too low, probability of false detection rises.**
- **If it is too high some DCP transmissions could be lost**
- **Local Time Tag (LTT) counts seconds from Turn On**

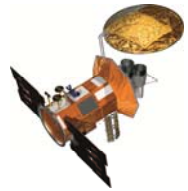


Threshold adjustement at Nominal Frequency

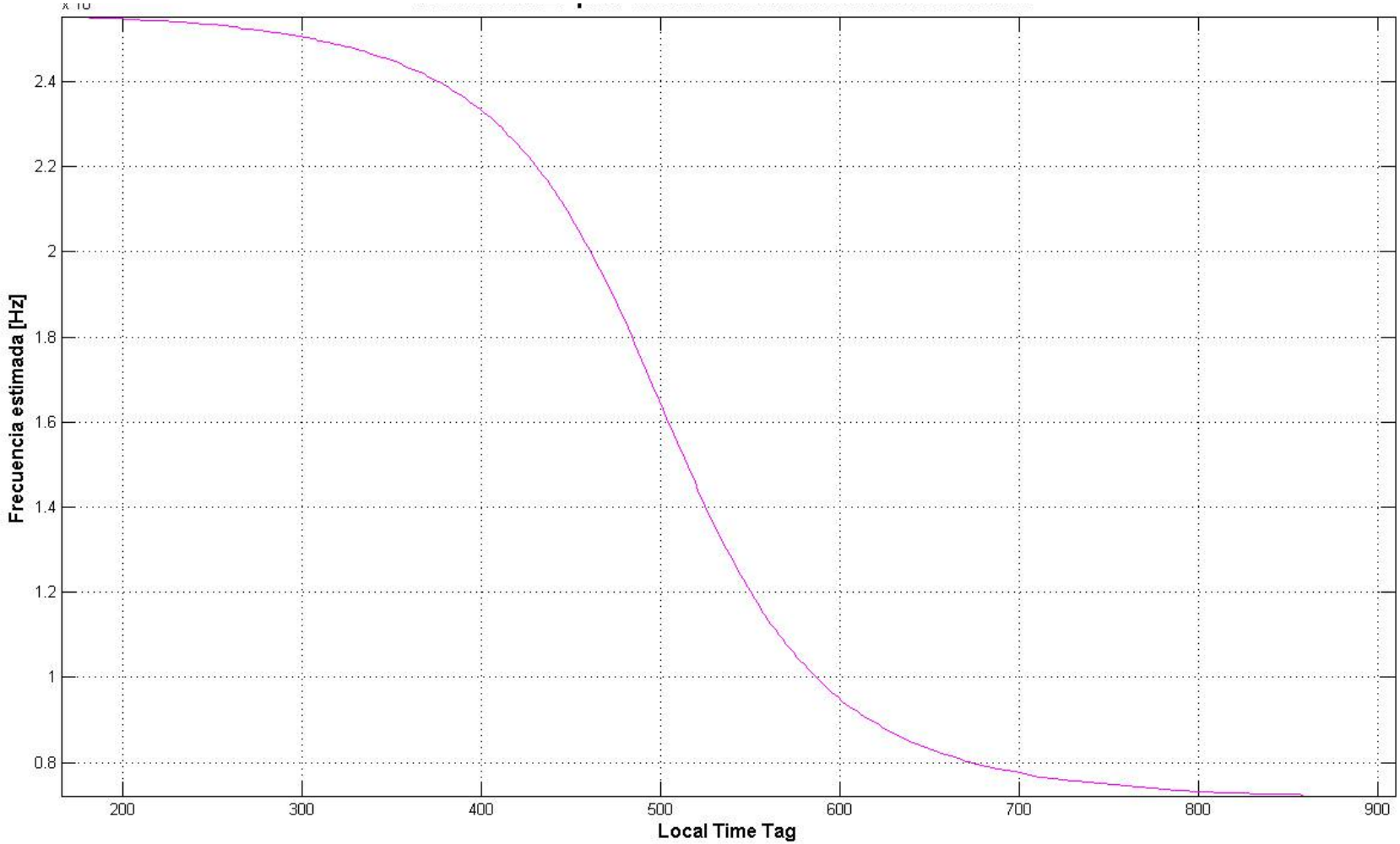
	NUMBER of CORRECT DATA FRAMES RECEIVED	PASS DURATION (sec)	MIN DISTANCE (Km) / MAX ELEVATION (degrees)
ADO6	213	1230	1578,742 / 18,7
AD07	264	1026	710,077 / 69,0
AD08	221	1200	1557,604 / 19,2
AD09	342	1200	1110,129 / 33,1

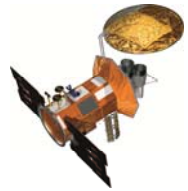
SAC-D Position when receiving Science Data from UNLP Station





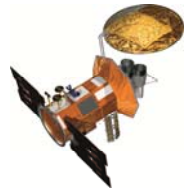
Doppler shift measured for each Data Frame received





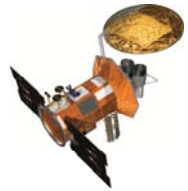
Threshold adjustement at other frequencies

- **The goal is to test Brazil and ARGOS frequencies.**
- **We do not have information about platforms IDs or data to validate received transmissions.**
- **DCS was commanded to receive data in these frequencies with different thresholds settings.**
- **After pass, received data was analyzed.**
- **Some Platform IDs are repeated, so their doppler shift was plotted against time to look for consistency and marked as valid.**
- **Total number of transmissions received range from 200 to 300 per pass in both frequencies.**



Conclusions

- **DCS Instrument was turned on for the first time on August 31 2011.**
- **During several months it was subject of many in-orbit tests to assess functionality and performance during commissioning phase.**
- **Tests were performed involving different transmission and reception modes, operational frequencies and parameters adjusting.**
- **As a result of those tests, DCS can be declared fully operational and ready to gather environmental data.**



Questions?