

Mars Express Power Challenge

CC71Q - Introducción a la Minería de Datos

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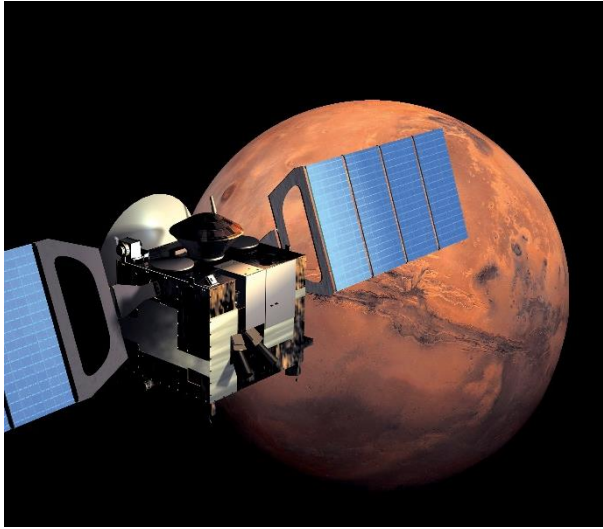
TYPVS ORBIS TERRARVM.

SEPTENTRIO



T E R R A A V S T R A L I S N O N D V M C O G N I T A

Mars Express Orbiter: Cartografía planetaria

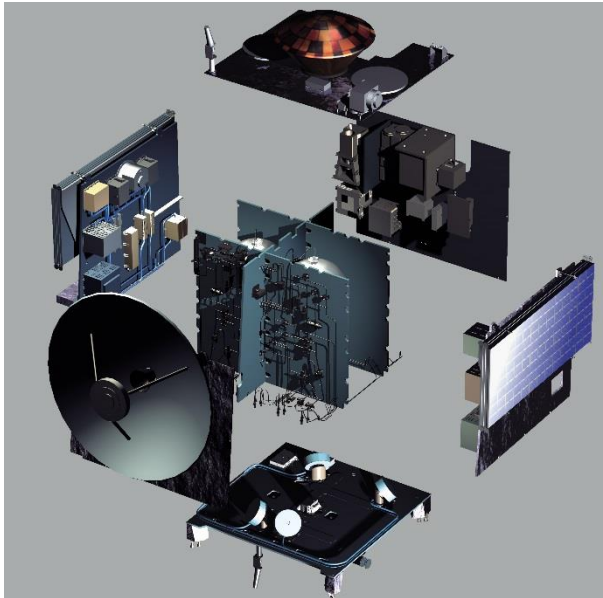


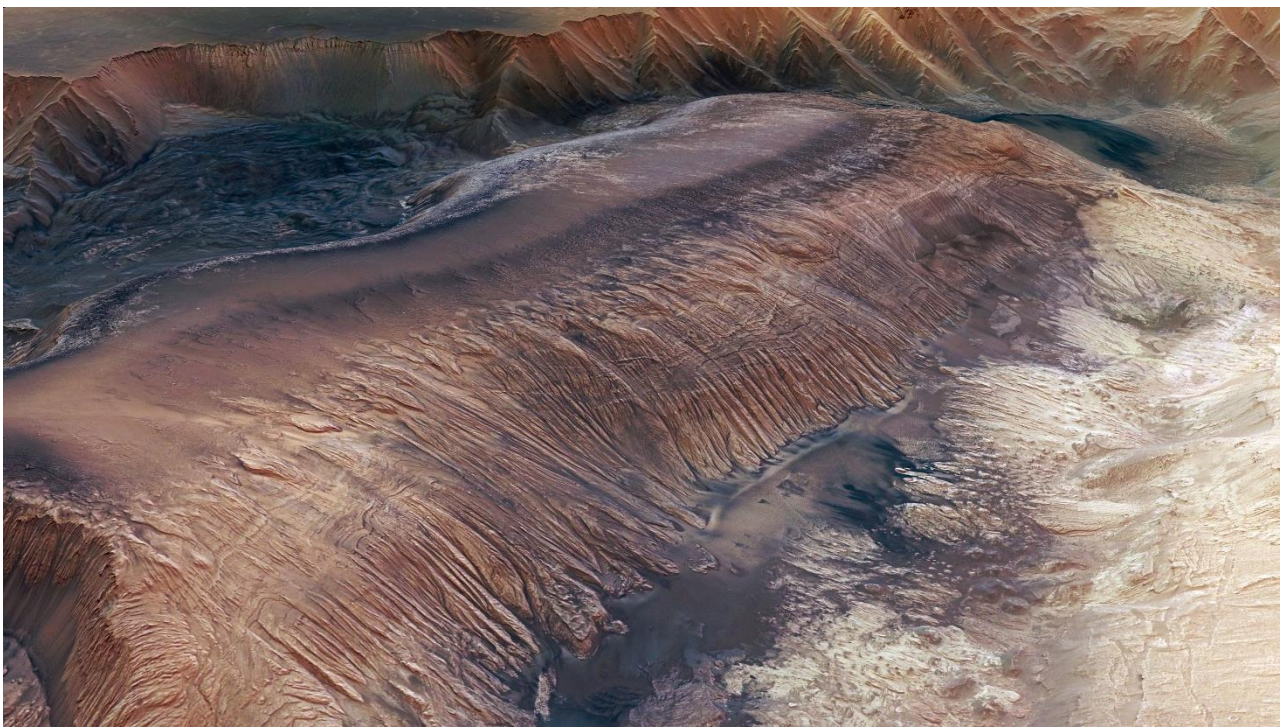
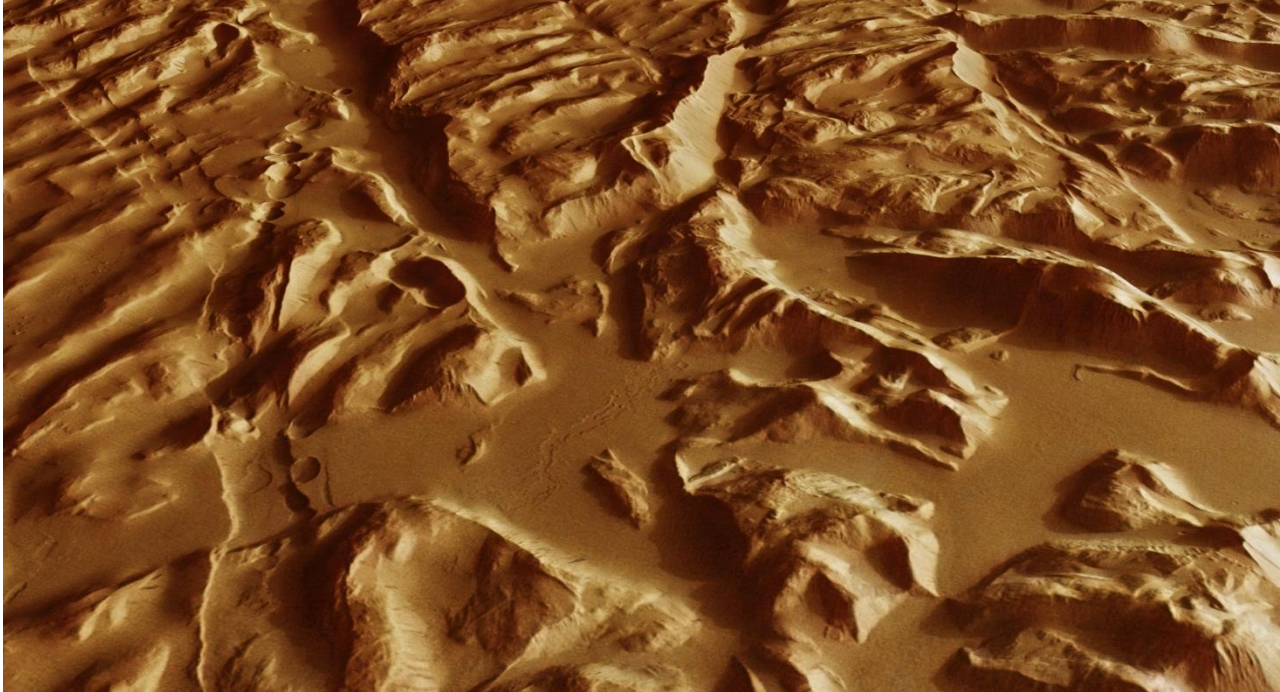
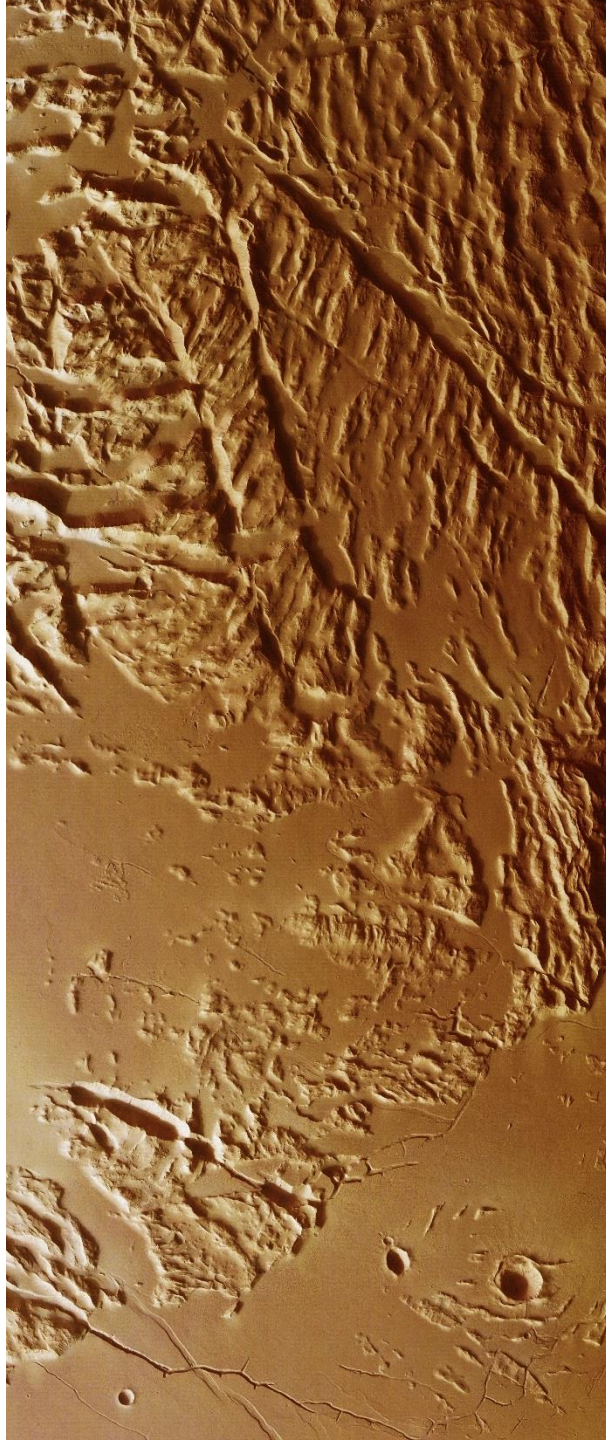
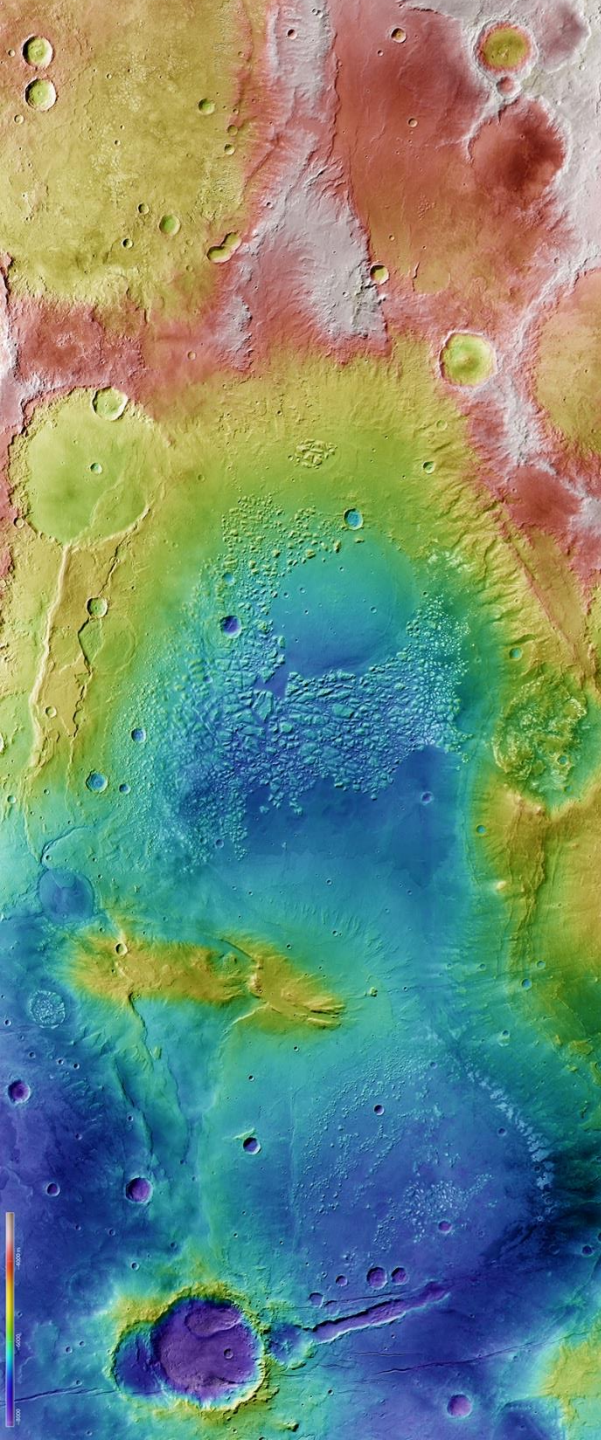
Mission:

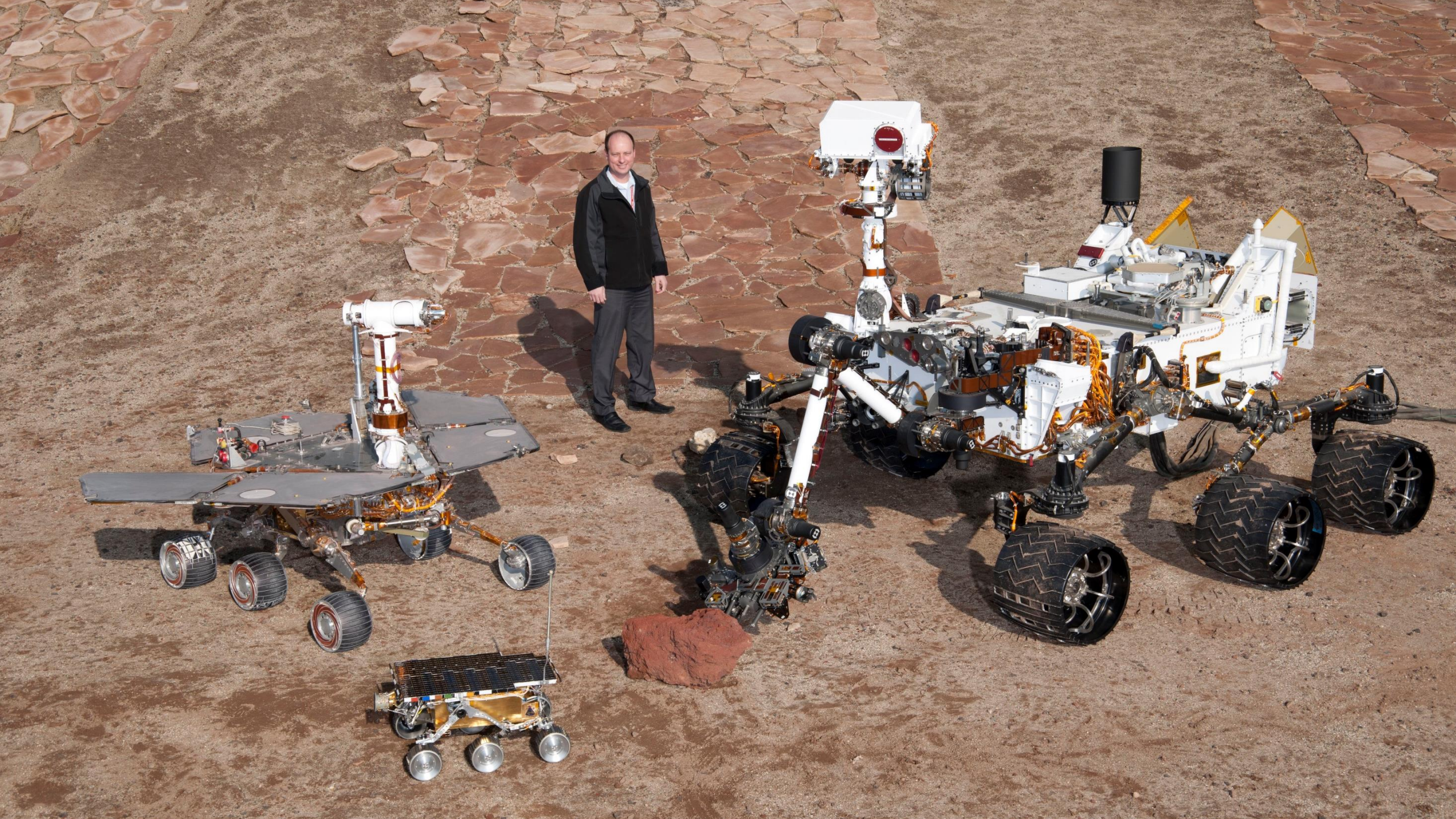
- Image the entire surface at high resolution (10 metres/pixel) and selected areas at super resolution (2 metres/pixel);
- Produce a map of the mineral composition of the surface at 100 metre resolution;
- Map the composition of the atmosphere and determine its global circulation;
- Determine the structure of the sub-surface to a depth of a few kilometres;
- Determine the effect of the atmosphere on the surface;
- Determine the interaction of the atmosphere with the solar wind.

Tools:

- High Resolution Stereo Camera (HRSC);
- Energetic Neutral Atoms Analyser (ASPERA);
- Sub-Surface Sounding Radar Altimeter (MARSIS);
- Mars Radio Science Experiment (MaRS);
- Ultraviolet and Infrared Atmospheric Spectrometer (SPICAM);
- Planetary Fourier Spectrometer (PFS);
- Visible and Infra Red Mineralogical Mapping Spectrometer (OMEGA);

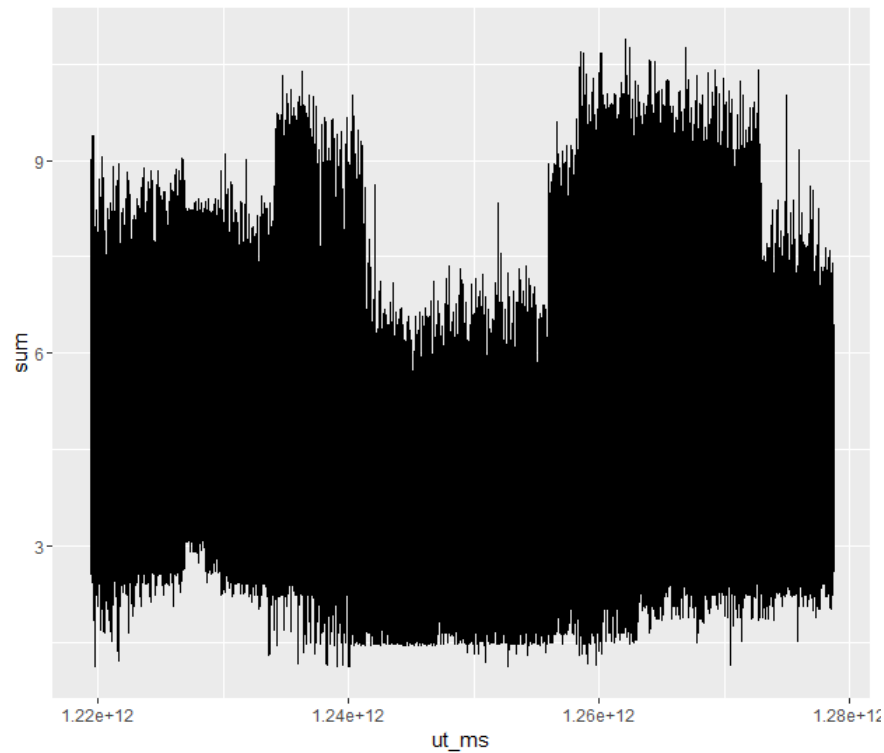




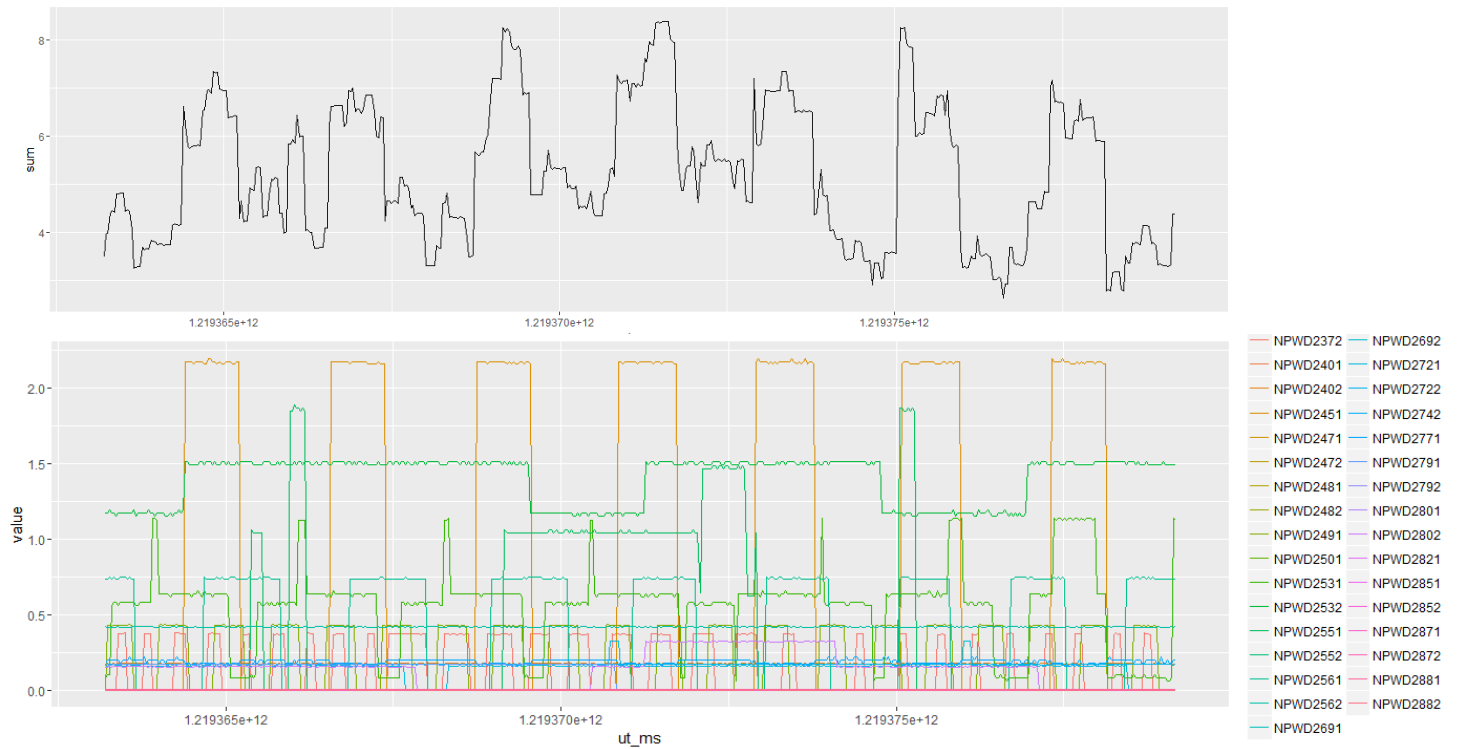


Mars Express Power Challenge

Problema: Predicción del consumo energético del satélite



Consumo: 1 año, Suma circuitos



Consumo [1:500]

Mars Express Power Challenge

Datos: Estado, Eventos

ut ms	subsystem
1,219,363,211,000	AXXX301A
1,219,364,909,000	AAAAF20C1
1,219,364,914,000	AAAAF57A1
1,219,364,919,000	AAAAF23G1
1,219,364,924,000	AAAAF60A1
1,219,365,615,000	AXXX305A
1,219,366,035,000	AXXX380A
1,219,366,635,000	ASEQ4200
1,219,367,381,000	ATTTF301E
1,219,369,061,000	ATTTF310A
1,219,369,181,000	APSF01A2
1,219,369,301,000	APSF02A1
1,219,369,306,000	APSF89A1
1,219,369,311,000	APSF40A1
1,219,369,316,000	APSF31A1
1,219,369,481,000	APSF23B1
1,219,369,486,000	APSF33A1
1,219,369,491,000	APSF28A1
1,219,369,496,000	APSF28A1
1,219,369,501,000	APSF28A1

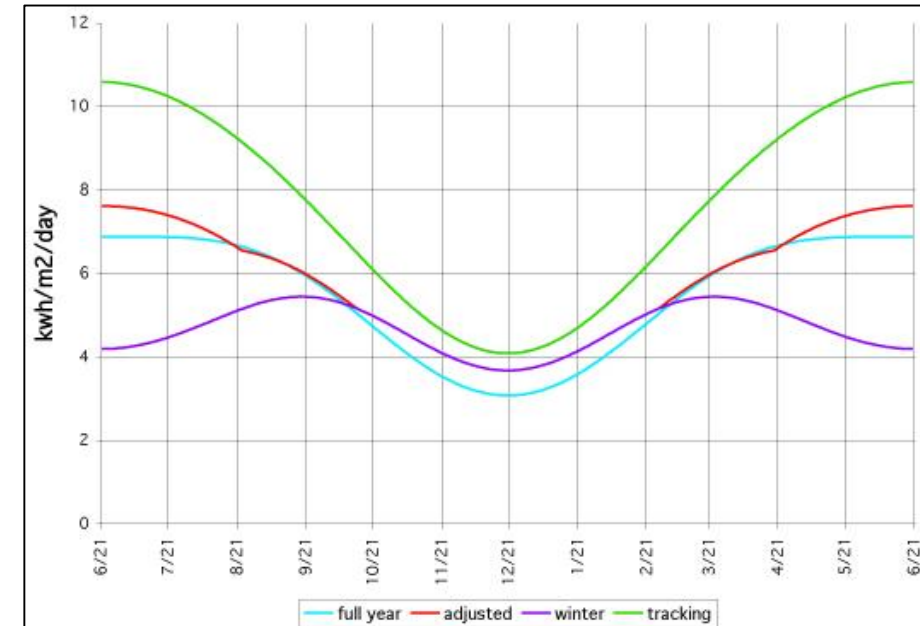
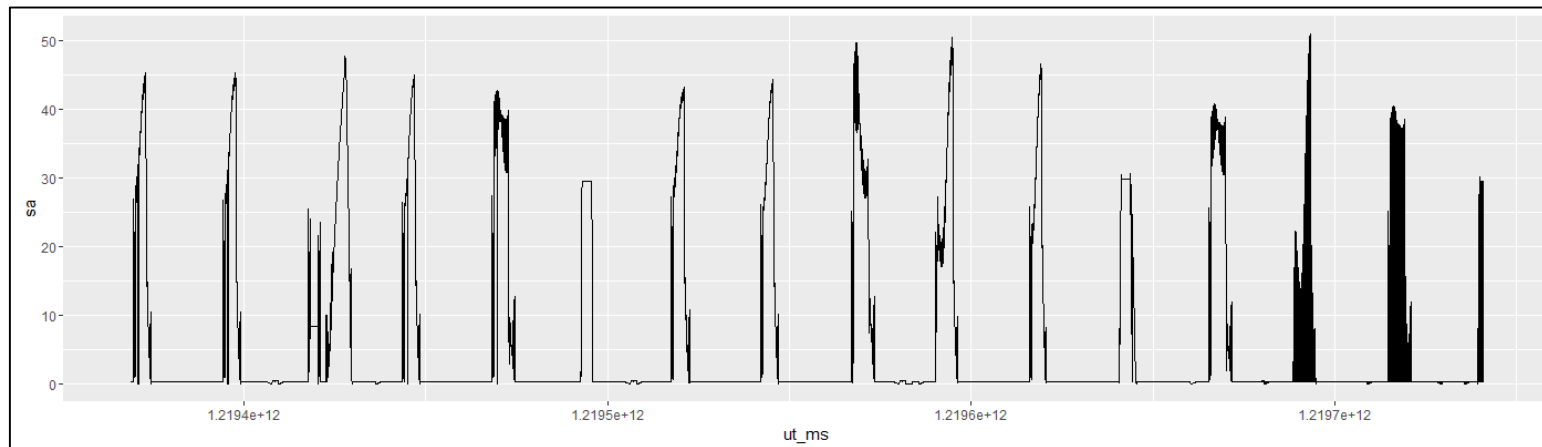
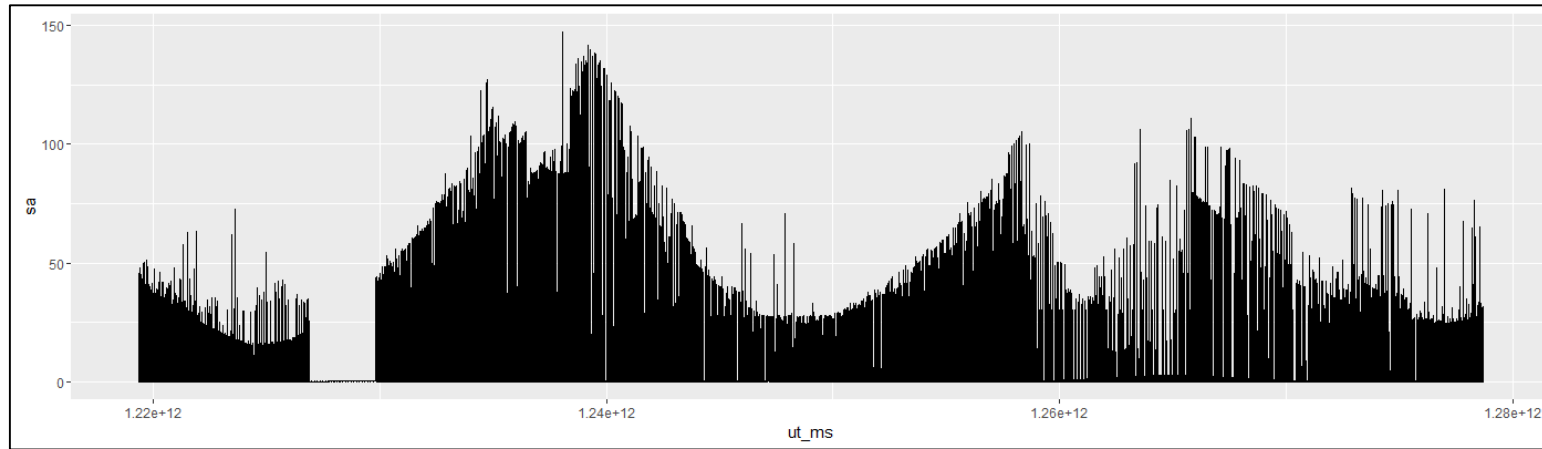
Data Mission Operations

ut ms	description
1,219,364,253,000	MLG_LOS_05/_RTLT_02373
1,219,364,356,000	NNO_AOS_00/_RTLT_02373
1,219,365,058,000	MLG_LOS_02/_RTLT_02373
1,219,365,755,000	NNO_AOS_05/_RTLT_02373
1,219,367,159,000	NNO_AOS_10/_RTLT_02374
1,219,368,640,000	4000_KM_DESCEND
1,219,369,280,000	MRB/_RANGE_06000KM_START
1,219,369,855,000	OCC_MARS_200KM_START/_RA_181.68/_DE_-00.08/_OMP_(296.35,-46.48)/_SZA_077
1,219,369,949,000	OCC_MARS_START/_RA_181.69/_DE_-00.08/_OMP_(299.32,-43.44)/_SZA_076
1,219,369,956,000	2000_KM_DESCEND
1,219,370,016,000	MRB_AOS_00
1,219,370,500,000	1200_KM_DESCEND
1,219,370,632,000	MRB_AOS_10
1,219,370,819,000	800_KM_DESCEND
1,219,370,902,000	MAR_PENUMBRA_START
1,219,370,986,000	MAR_UMBRA_START
1,219,371,075,000	MAR_UMBRA_END
1,219,371,094,000	MRB_LOS_10
1,219,371,152,000	MAR_PENUMBRA_END
1,219,371,317,000	MRB_LOS_00

Other Events

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Datos: Sol



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Metodología propuesta

- Metodología:
 - Continuous values prediction: Regression
- Pre-procesamiento de los datos:
 - Identificar y transformar comandos ON/OFF de pulsos a zonas
 - Eliminar ruido de mediciones
 - Alinear comandos con tiempos más cercanos
 - Agregar características: Crecimiento, Varianza
- Asociación:
 - Buscar correlaciones entre circuitos y comandos
- Procesamiento:
 - Entrenamiento por circuitos