



# URUGUAY

Situación para la  
adopción de la  
mínima separación  
longitudinal  
**10NM**

# COMUNICACIONES




- 8 estaciones VHF rango extendido (126.3 Mhz., 128.5 Mhz., **121.5 MHZ**)
- Equipos ED-137 nativos (version primaria)
- Redundancia:
  - 2 tx y 2 rx por frecuencia.
  - Estaciones OPR y STBY
  - FO a cada estación en anillo
- Red MPLS de datos con QoS
- Energía de respaldo  
Red + UPS + GEN
- Monitoreo de mantenimiento y configuración remota desde el Centro de Control



# FIR of A sites

6000ft 1828.15m

Ant.Height: Tx:25m Rx:1828m  
Frequency: 126.3 MHz  
ERP: 41.2098 W  
Antenna gain: 2.15dBi  
System losses: 3dB  
Transmitter: 50W

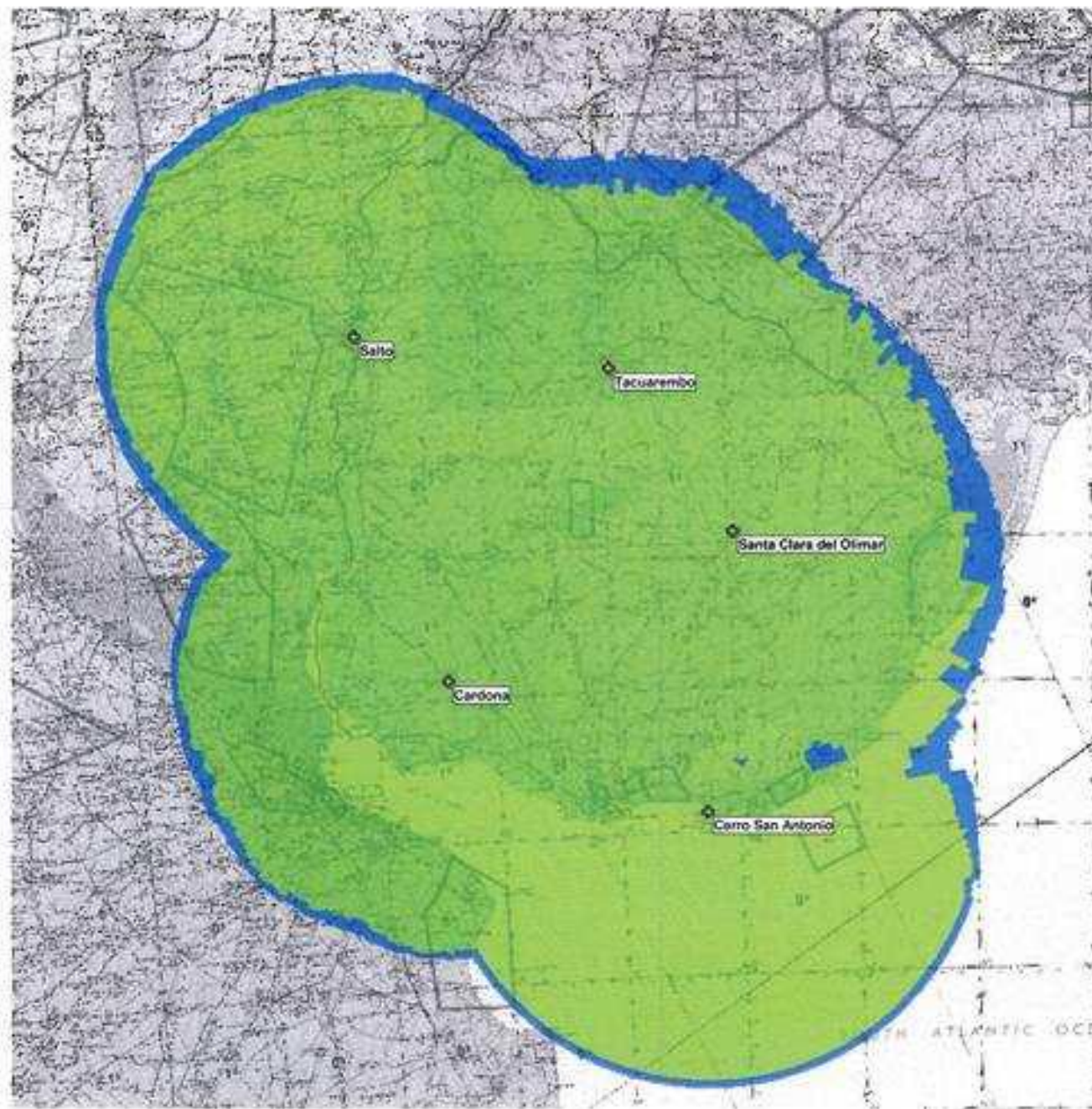
-   $E < 29.54$  dB $\mu$ /m
-   $29.54 <= E < 37.5$
-   $37.5 <= E < 40$

**NORTHROP GRUMMAN**

Park Air Systems

0 100 km

HERTZ Mapper - (c)2005 ATDI



# FIR of B sites

6000ft 1828.15m

Ant Height: Tx: 25m Rx: 1828m  
Frequency: 128.3 MHz  
ERP: 41.2698 W  
Antenna gain: 2.15dBi  
System losses: 3dB  
Transmitter: 50W

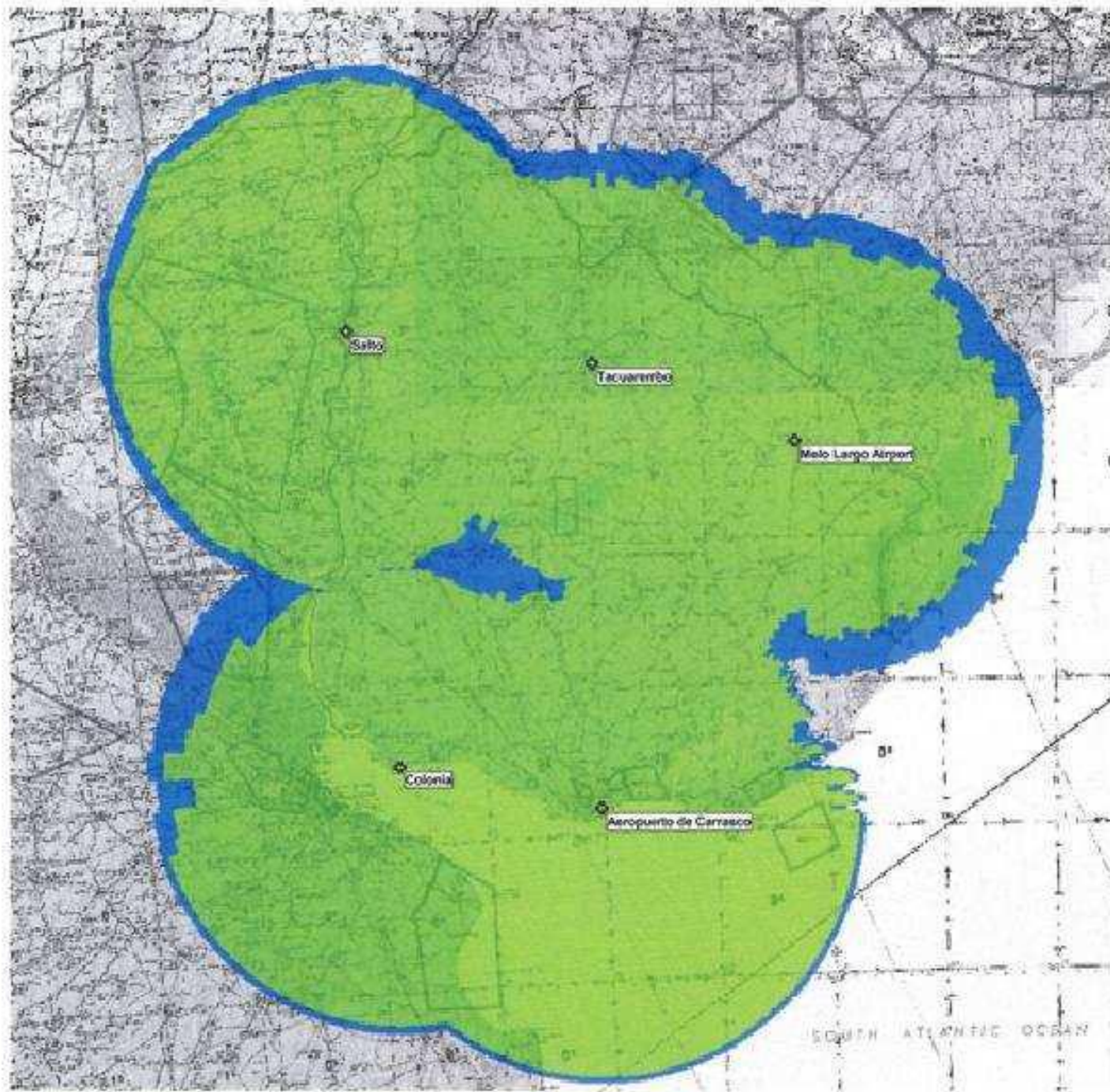
- $E < 29.54 \text{ dB}\mu\text{V/m}$
- $29.54 \text{ dB}\mu\text{V/m} \leq E < 37.5$
- $37.5 \text{ dB}\mu\text{V/m} \leq E < 40$

**NORTHROP GRUMMAN**

Park Air Systems

0 100 km

Hertz Mapper - (c)2005 ATDI



# FIR of A sites and Melo

6000ft 1828.15m

Ant. Height: Tx: 25m Rx: 1828m  
Frequency: 126.5 MHz  
ERP: 41,2000 W  
Antenna gain: 2.15dBi  
System losses: 3dB  
Transmitter: 50W

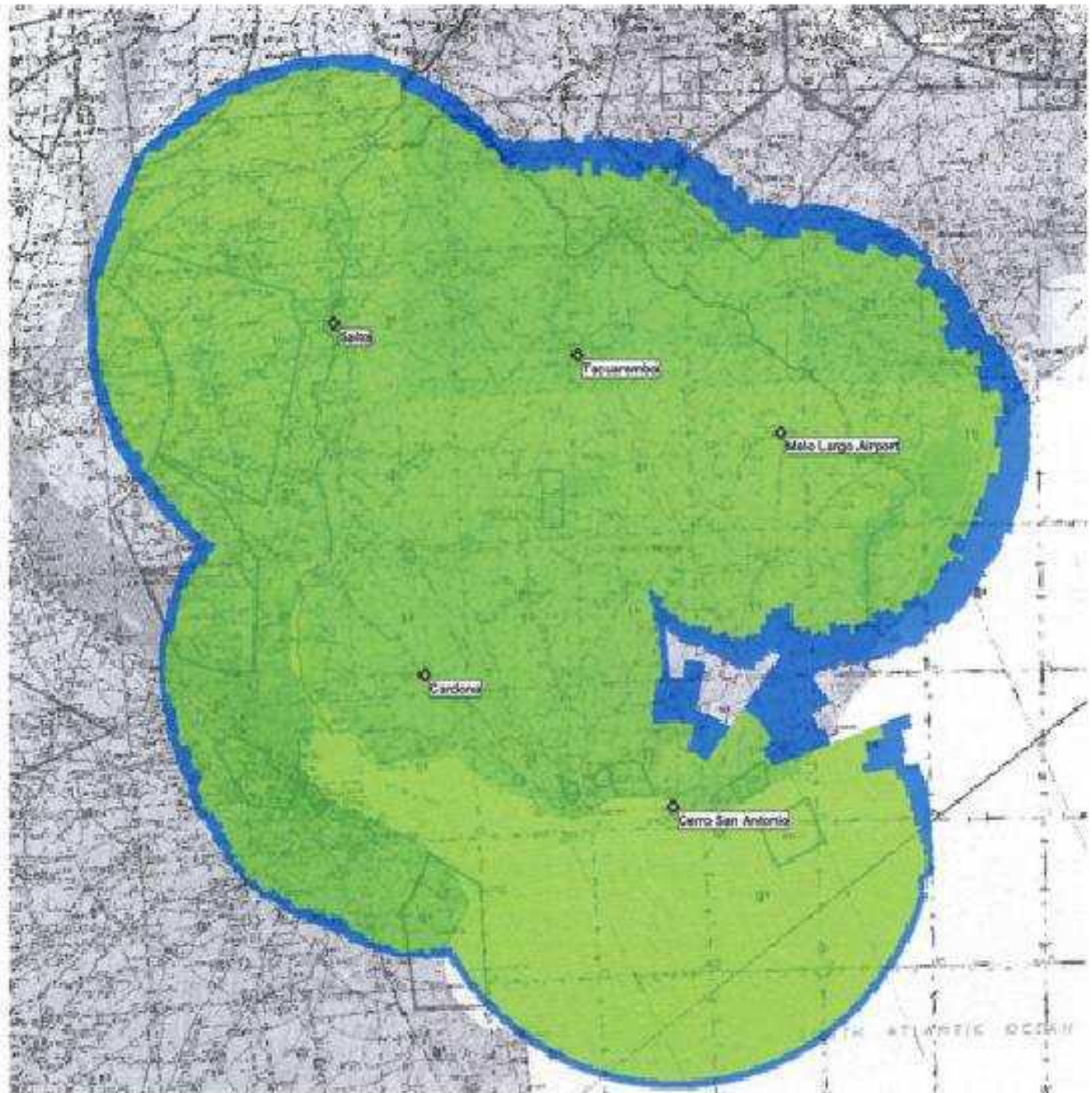
- E < 28.54 dBµV/m
- 28.54 <= E < 37.5
- 37.5 <= E < 40

NORTHROP GRIFFIN

Park Air Systems

0 100 km




HERTZ Mapper - (c)2005 ATDI



# TMA Carrasco

3000ft 914.08m

Ant.Height: Tx: 25m Rx: 914m  
Frequency: 119.2 MHz  
ERP: 41,200W  
Antenna gain: 2.15dBi  
System losses: 3dB  
Transmitter: 50W

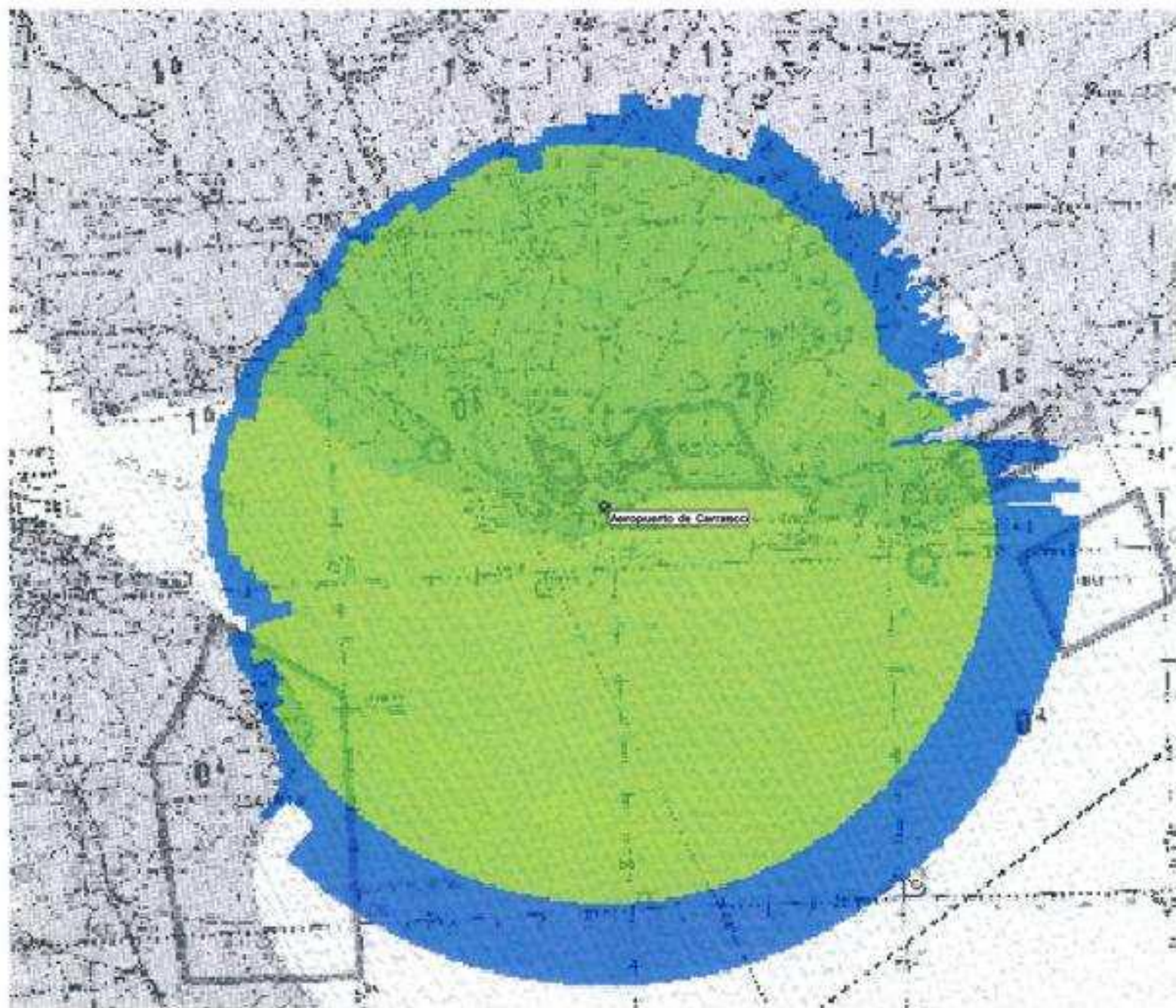
-  E < 29.54 dBuV/m
-  29.54 <= E < 37.5
-  37.5 <= E < 40

**NORTHROP GRIFFIN**

Park Air Systems






Hertz Mapper - (c)2005 ATCI



# TMA Colonia

3000R 914.08m

Ant. Height: Tx: 25m Rx: 914m  
Frequency: 120.8 MHz  
ERP: 41,2098 W  
Antenna gain: 2.15dBi  
System losses: 2dB  
Transmitter: 50W

-  E < 29.54 dBµV/m
-  29.54 < E < 37.5
-  37.5 < E < 40

*NORTHROP GRUMMAN*

Park Air Systems






Hertz Mapper - ©2005 ATDI



# FIS Oceanic Area

## San Antonio Melo

Ant. Height: Tx: 25m Rx: 13711m  
Frequency: 128.0 MHz  
ERP: 299,4000 W  
Antenna gain 10.15dBi  
System losses 3dB  
Transmitter 50W

-  E < 29.81 dBµV/m
-  29.84 <= E < 37.5
-  37.6 <= E < 40

**NORTHROP GRUMMAN**

Park Air Systems



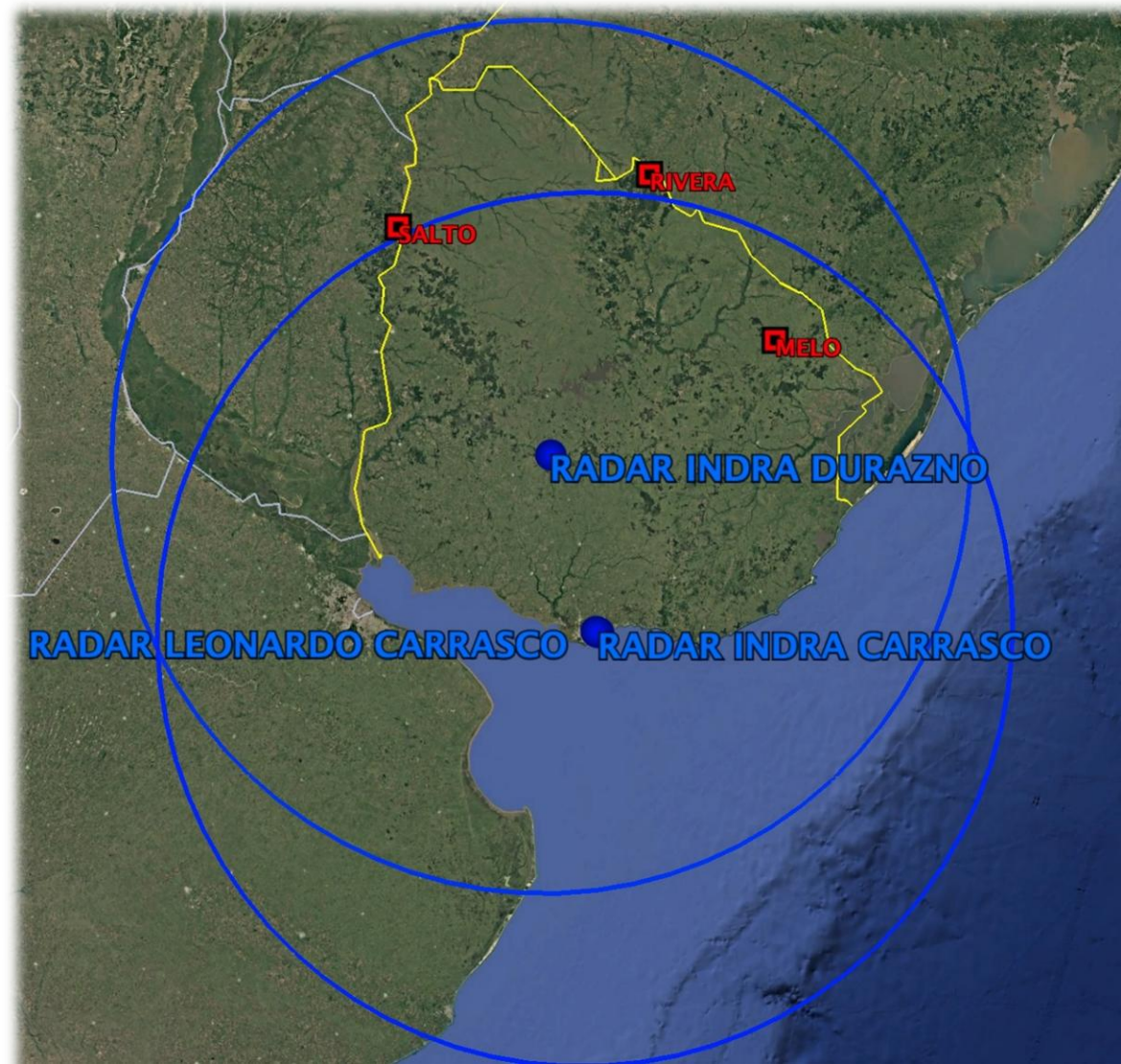
HEATZ Mapper - (c) 2005 ATDI



# VIGILANCIA

## Radares

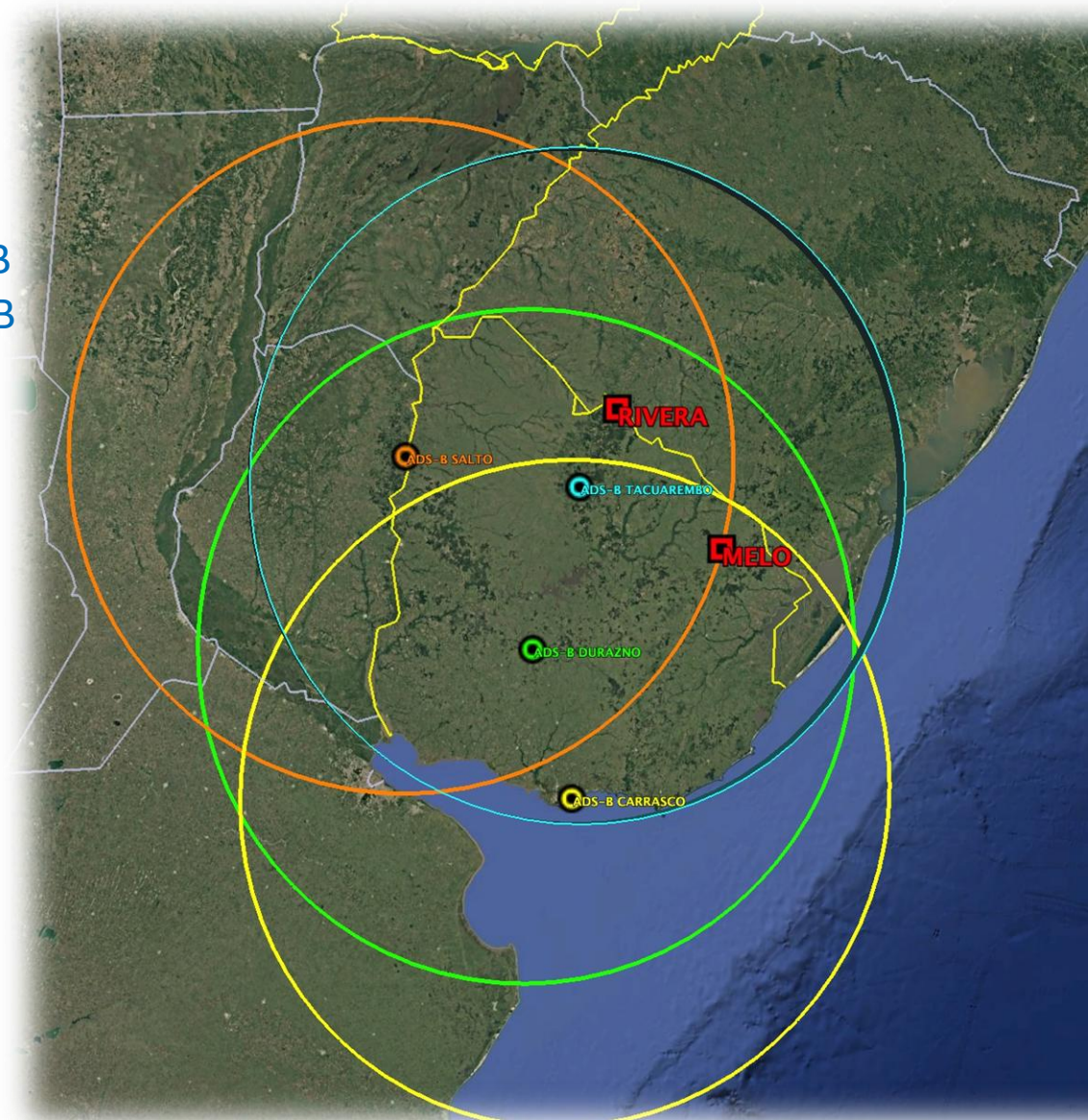
- SSR Modo S en Durazno + ADS-B
- SSR Modo S en Carrasco + ADS-B
- Redundancia:
  - PSR/SSR Modo S Carrasco
- Planificado (2028):
  - PSR/MMSR Salto + ADS-B
  - PSR/MMSR Rivera + ADS-B
  - PSR/MMSR Melo + ADS-B



# VIGILANCIA

## ADS-B

- Asociado a Radar
  - SSR Modo S en Durazno + ADS-B
  - SSR Modo S en Carrasco + ADS-B
- Stand Alone
  - Tacuarembó
  - Salto
- Planificado (2028):
  - PSR/MMSR Rivera + ADS-B
  - PSR/MMSR Melo + ADS-B



# ADS-B Carrasco

200

100

0

-100

-200

-300

300

200

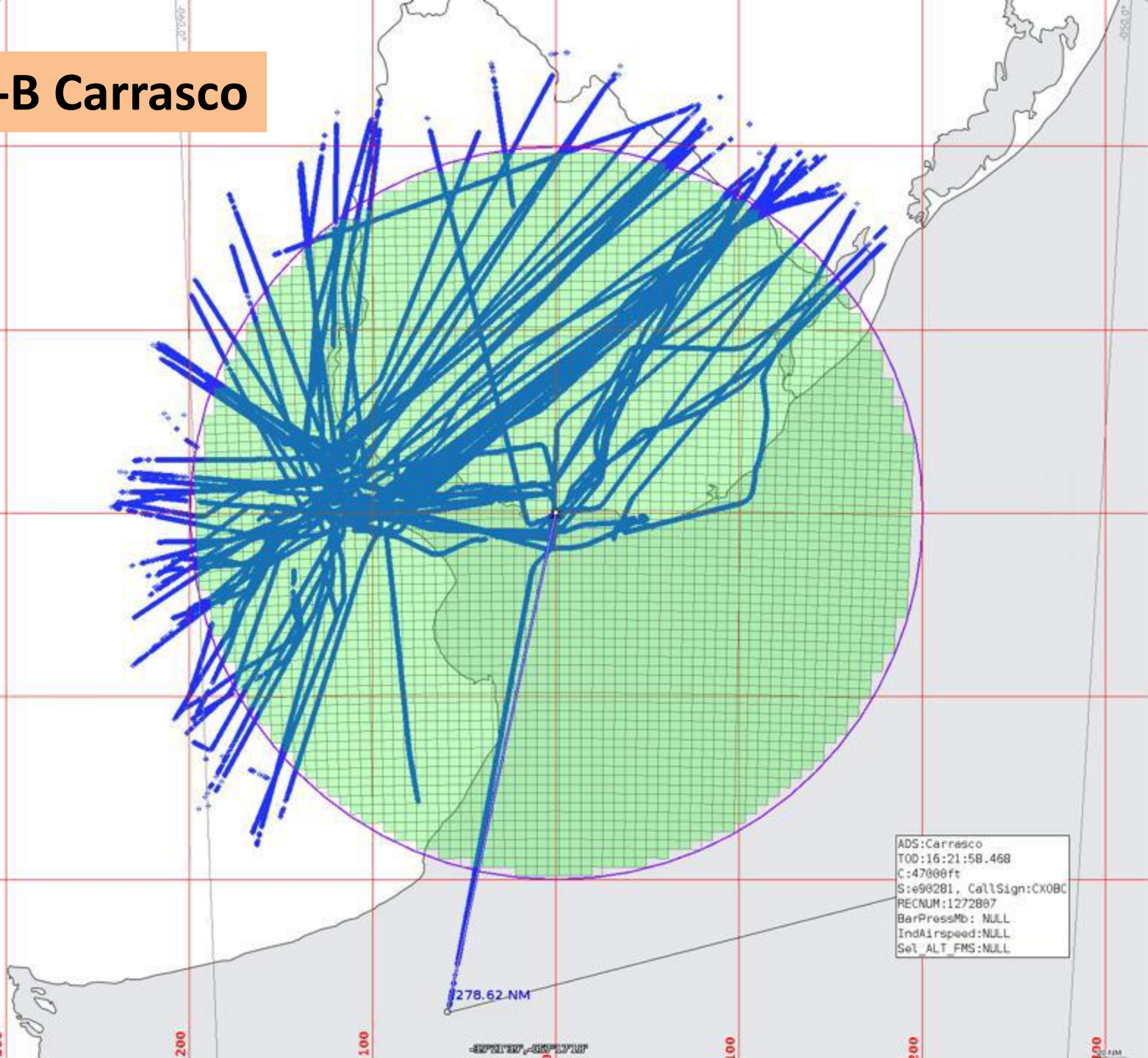
100

-50000, -600000

100

200

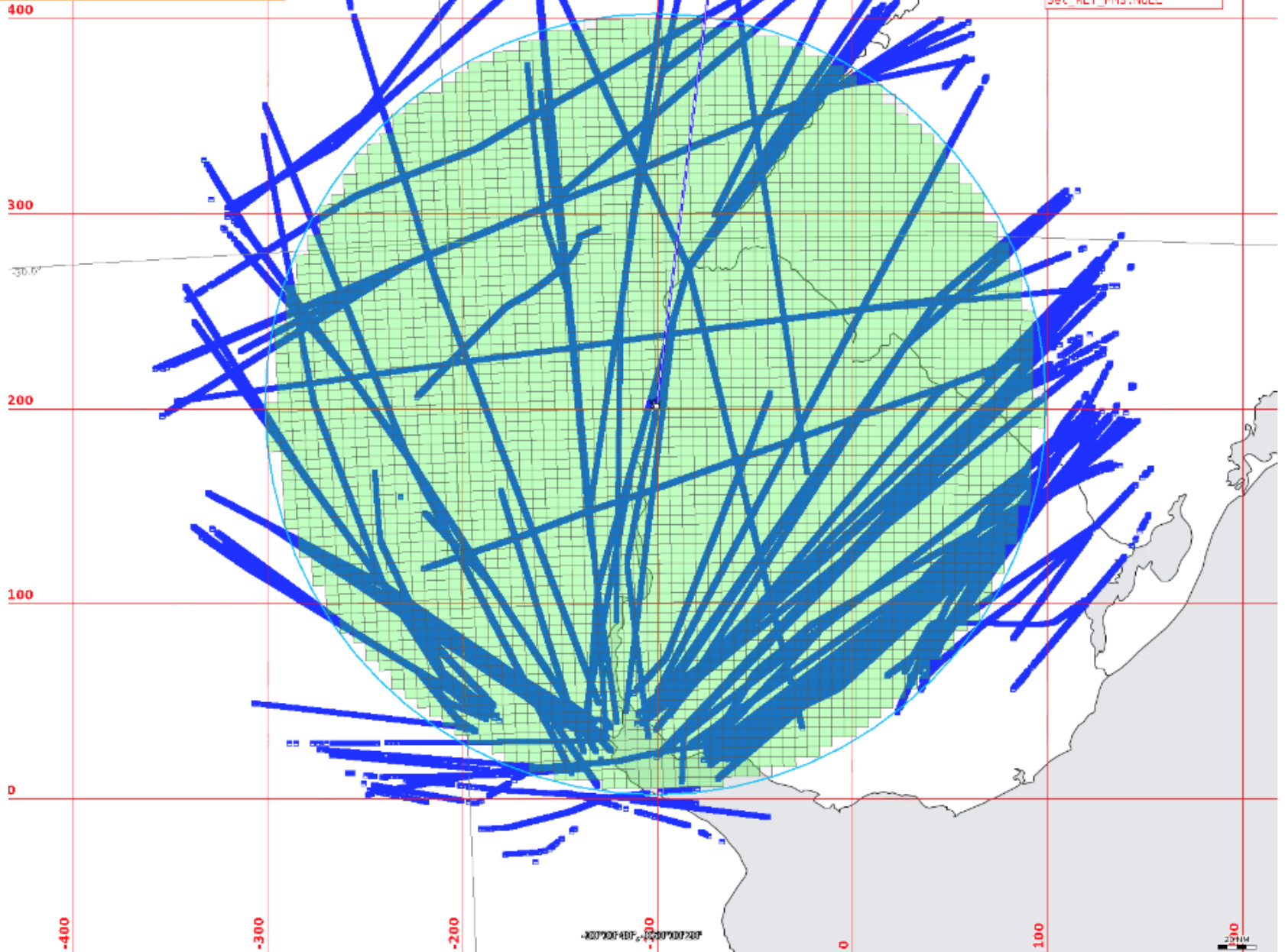
300



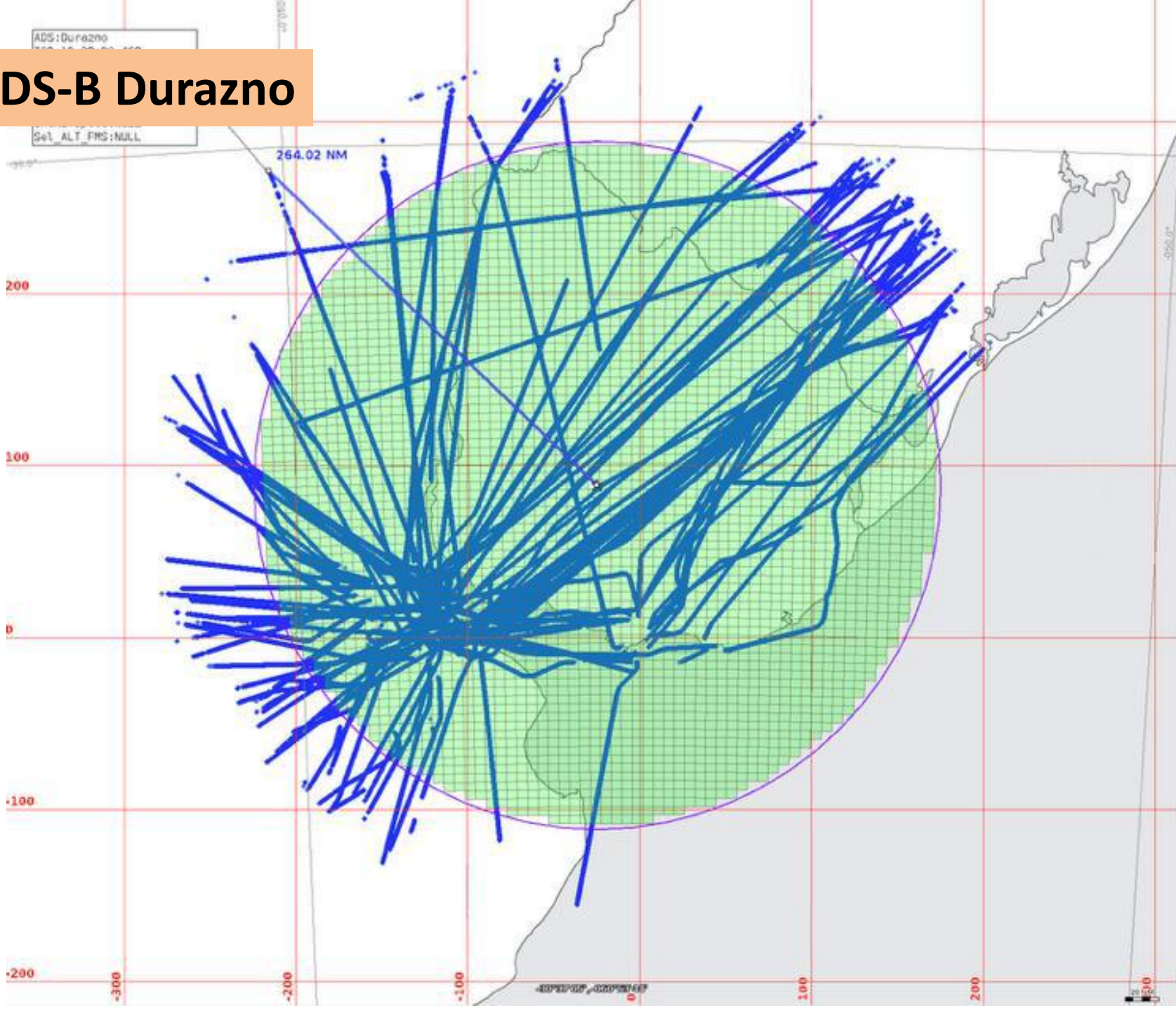
ADS:Carrasco  
TOD:16:21:58.468  
C:47000ft  
S:e90281, CallSign:CX0BC  
RECNUM:1272887  
BarPressMb: NULL  
IndAirspeed:NULL  
Sel\_ALT\_FMS:NULL

278.62 NM

# ADS-B Salto



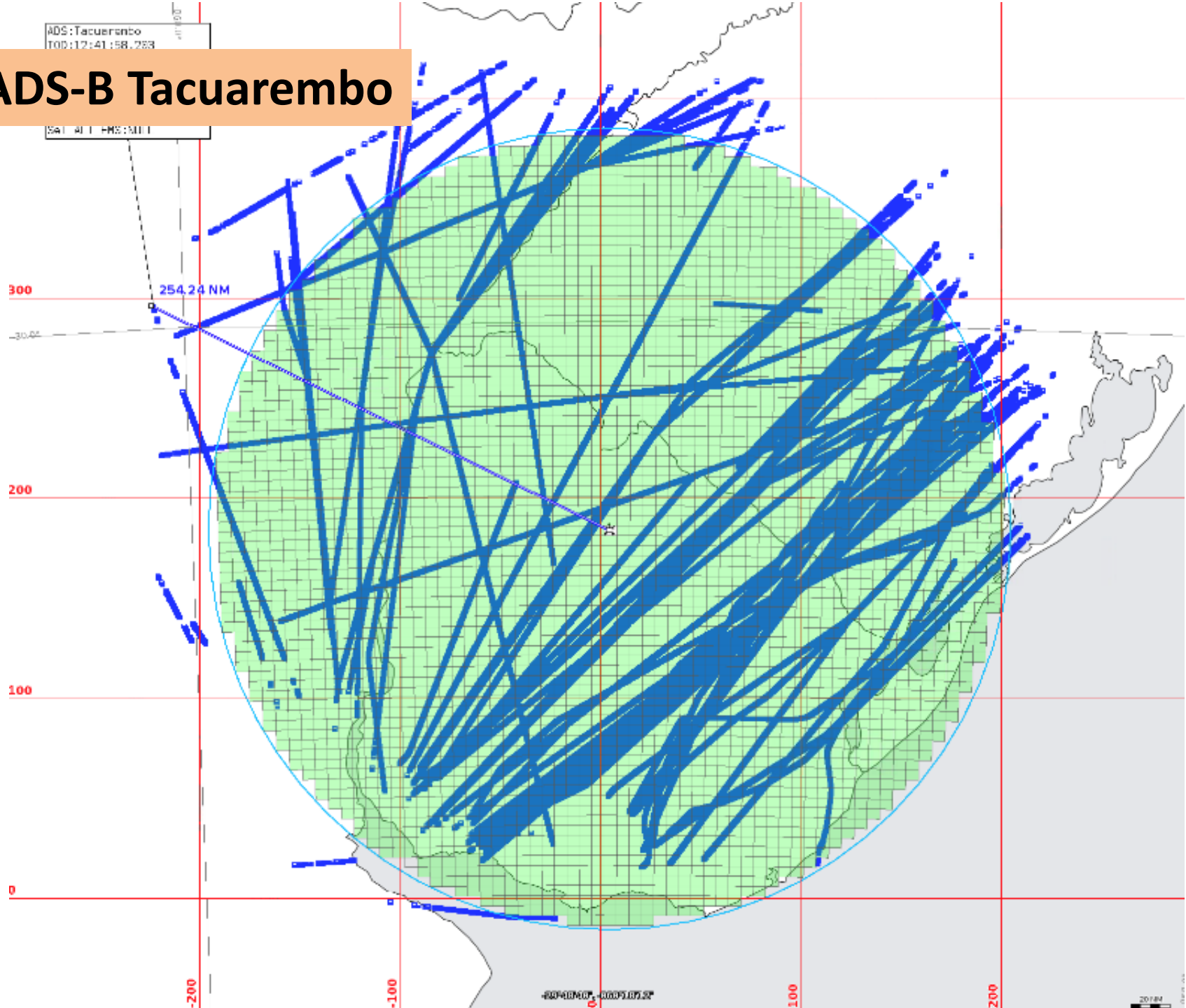
# ADS-B Durazno



ADS: Tacuarembo  
TOD: 12:41:58.233

# ADS-B Tacuarembo

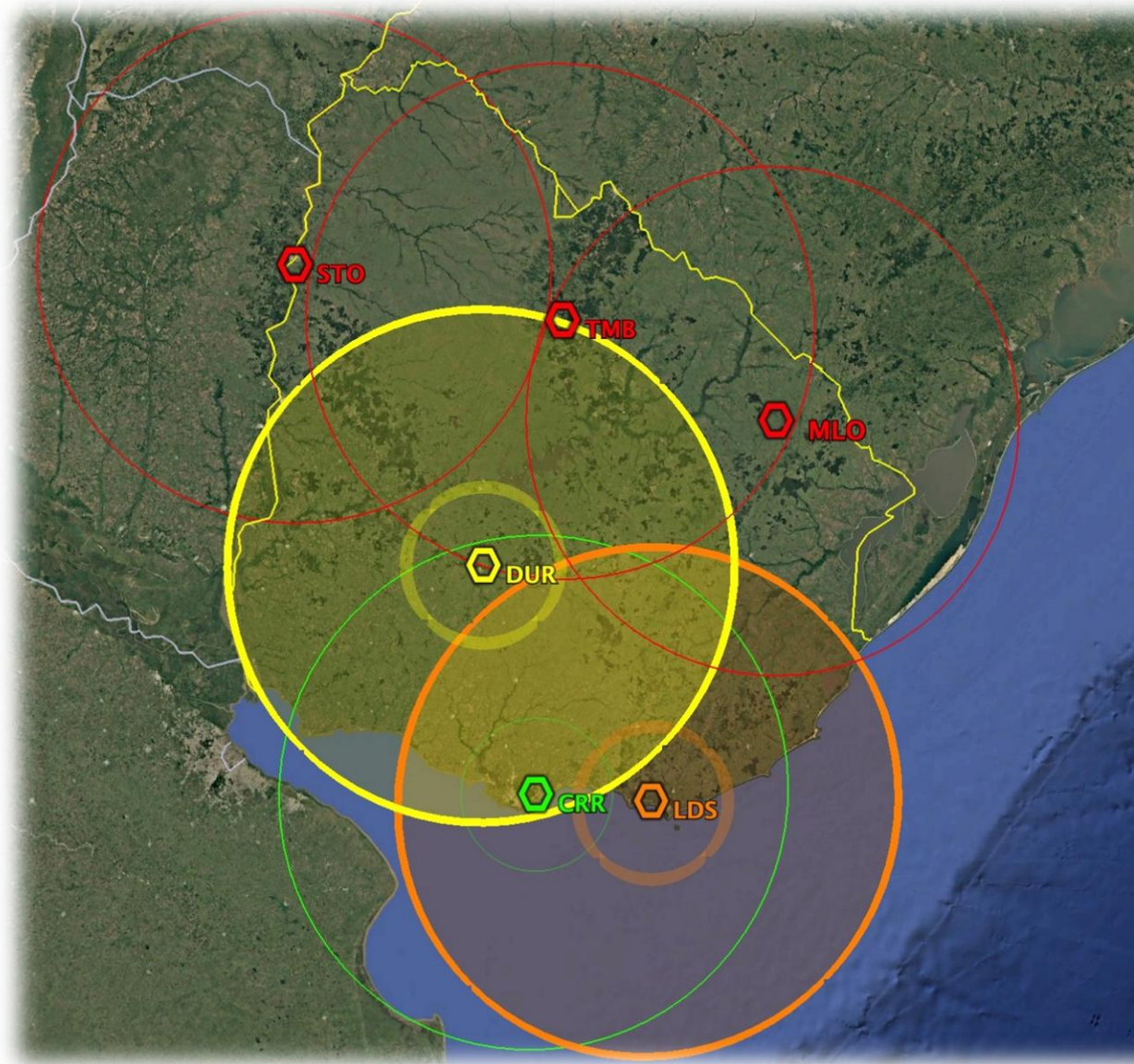
SAT: 411-FRE:NTT



# RED MINIMA OPERATIVA

## DME - DME

- Operativos:
  - VOR/DME LDS  
Laguna del Sauce
  - VOR/DME DUR  
Durazno
- Fuera de Servicio (2027)
  - VOR/DME CRR  
Tacuarembó
- Planificado (2027-2028):
  - VOR/DME STO  
Salto
  - VOR/DME TMB  
Tacuarembó
  - VOR/DME MLO  
Melo



# PENDIENTES

- Verificación práctica de cobertura PBCS.
- Actualización sistema radar – Aircon 2100 (DO 260B).
- Completar implementación del AIDC
- CPDLC en VHF espacio aéreo continental
- Actualización VCS – SDC 2000IP (VoIP total).
- Ampliar MON al norte del país. (VOR/DME SUSO, SUMO, SUTB) + actualización de los actuales
- Ampliar cobertura de radar al norte del país (SUSO, SURV, SUMO).