

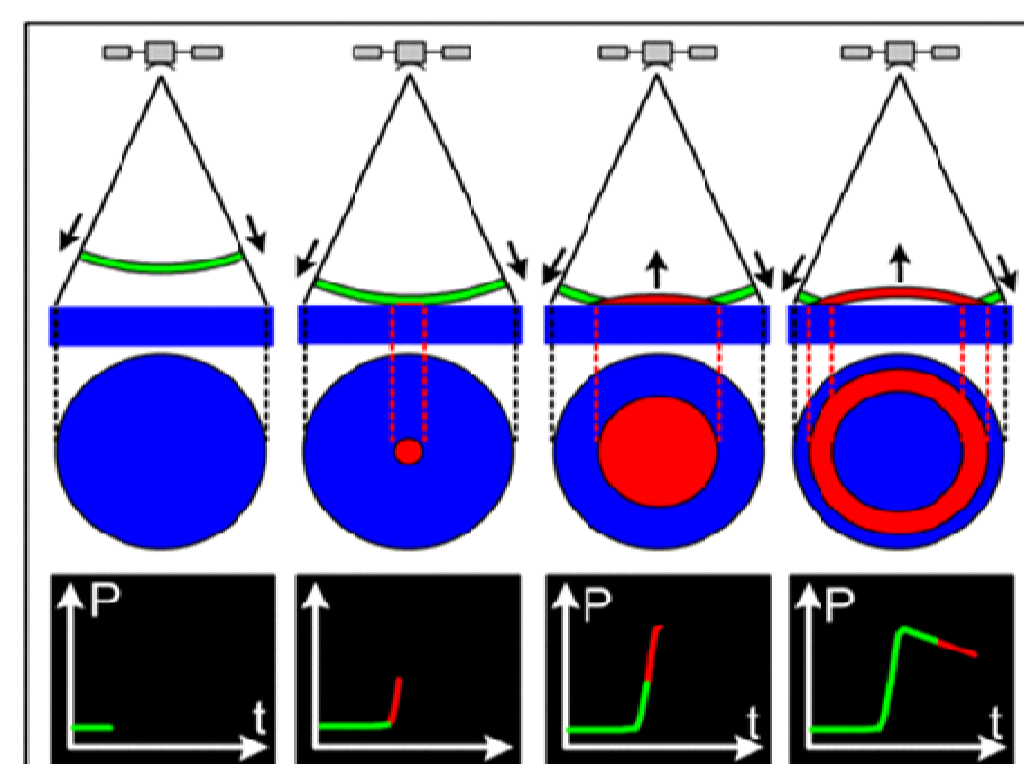
OVERVIEW

In the framework of the Vendée Globe 2008 Regatta (solo and non-stop around the globe) and the Jule Verne Trophy (crew, non-stop around the globe) in 2010, CLS has implemented an experimental service for the detection of icebergs, in addition to its usual Argos localization services. Icebergs position and surface area are detected through the analysis of SAR images acquired by ENVISAT and RADARSAT-2. These detections are used as input in an iceberg drift model.

However, it is also possible to detect icebergs with radar altimetry, as demonstrated by Tournadre et al. (2008) *. The signature of icebergs in the altimetric echoes takes the form of peaks that are mainly seen in the thermal noise part of the waveform. It is also possible to estimate the height of the iceberg over the water from the offset of these peaks with respect to main leading edge. Detections algorithms have been developed at CLS for Jason-1, Jason-2 and ENVISAT (Gaquiere, 2009). Note that a contrario, it is important to identify and remove these «polluted» data from the data set used for classical oceanic studies since the corresponding «ocean» ranges may be altered. At least, not only the detection of icebergs via altimetry could be used to optimize the programming of SAR images acquisition in the framework of an operational iceberg detection service, but the year-round monitoring of icebergs population is of primary scientific interest. We present an overview of the detected icebergs population in the Austral oceans for the period August 2008 - March 2010.

*Tournadre et al., 2008. Iceberg detection in open water by altimeter waveform analysis. J. Geophys. Res., 113, C08040.

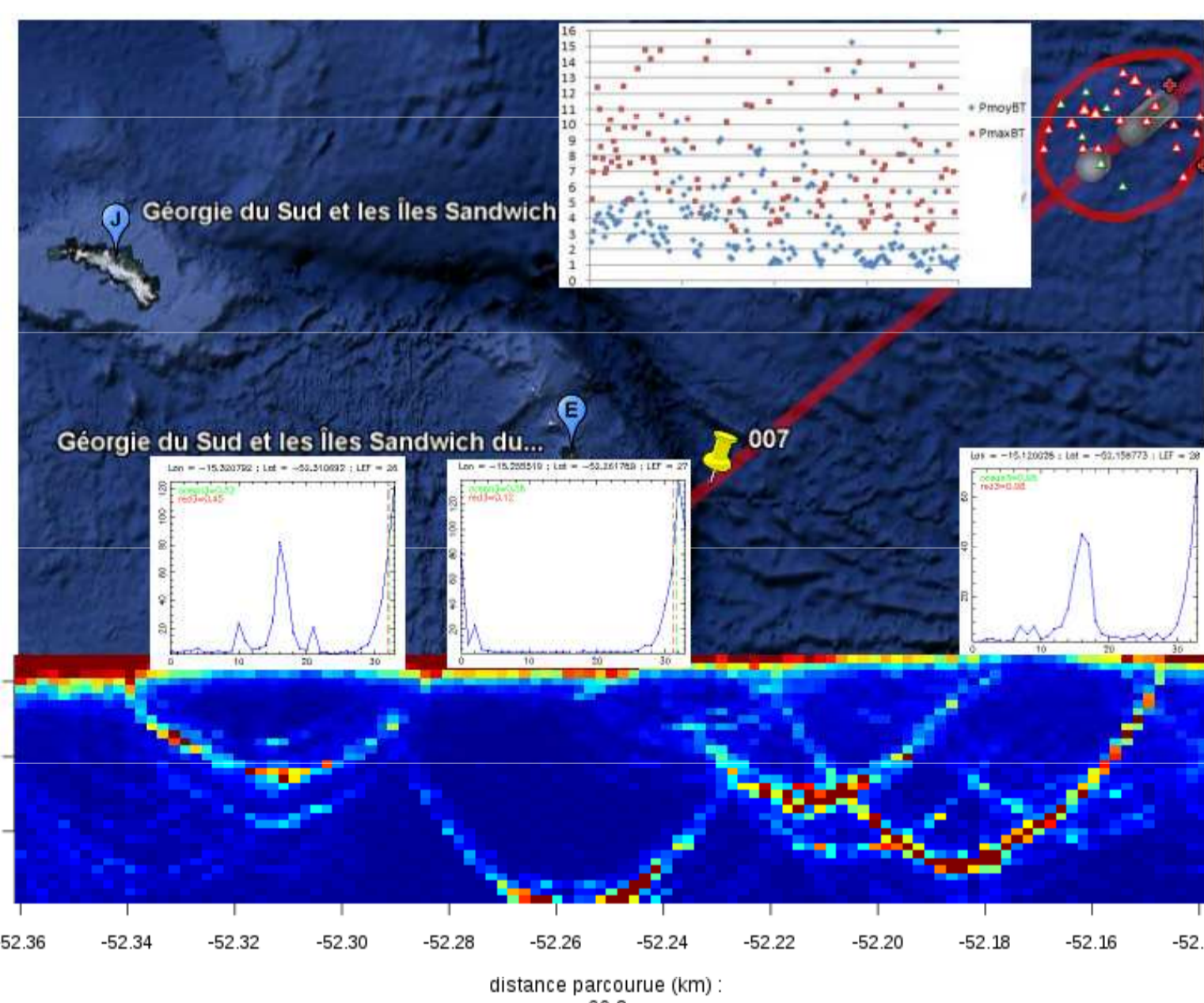
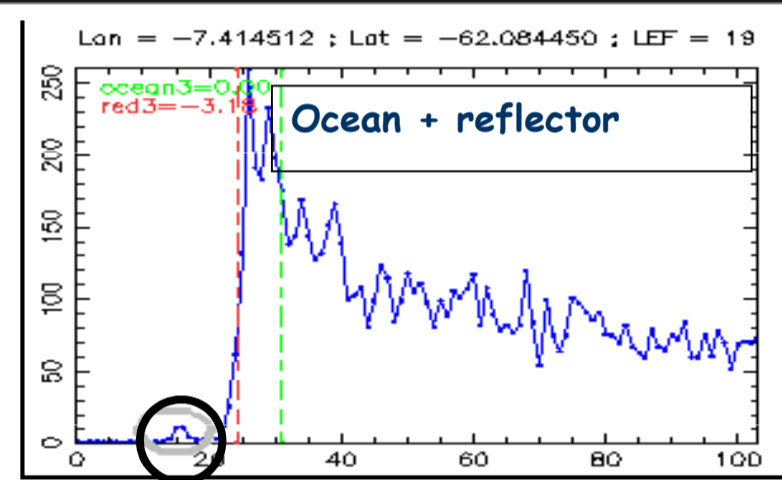
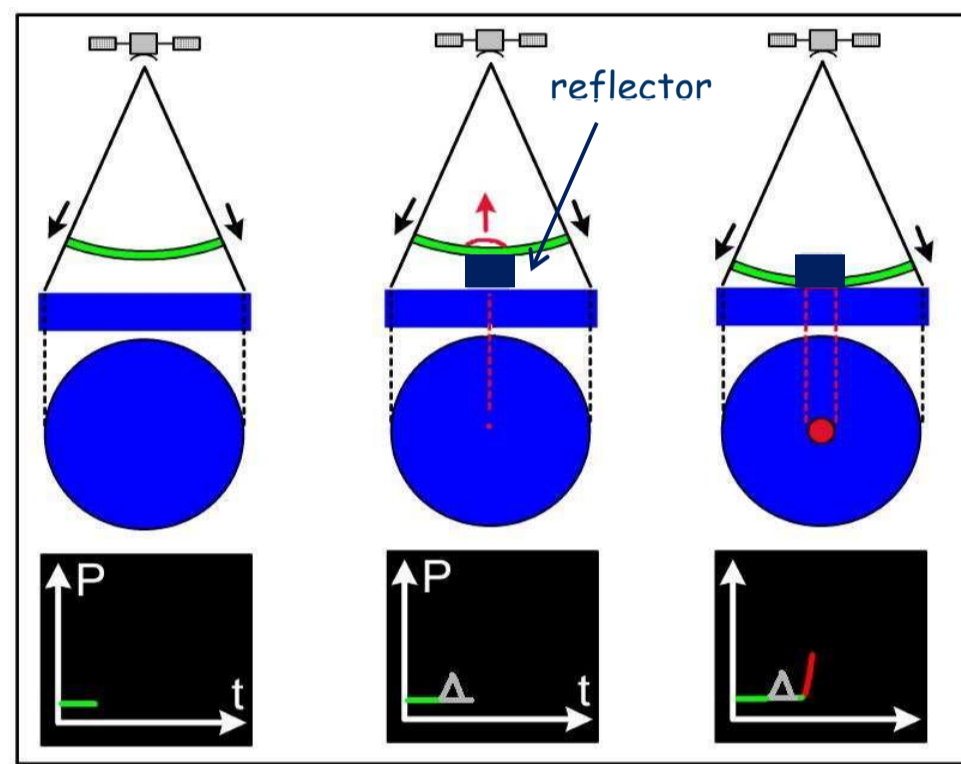
THE BASICS



The signature of an isolated reflector floating on the ocean surface takes the form of a peak usually detectable in the thermal noise part of the waveform. This peak becomes a parabola in a 2D representation of the waveforms.

The height of the iceberg above the water can be estimated with the shift between the peak and the leading edge (10 gates ~ 5 m).

The combination of several satellites allows a reasonably dense coverage (example below on the Cape Horn area: 10 days of J1+J2+EN)



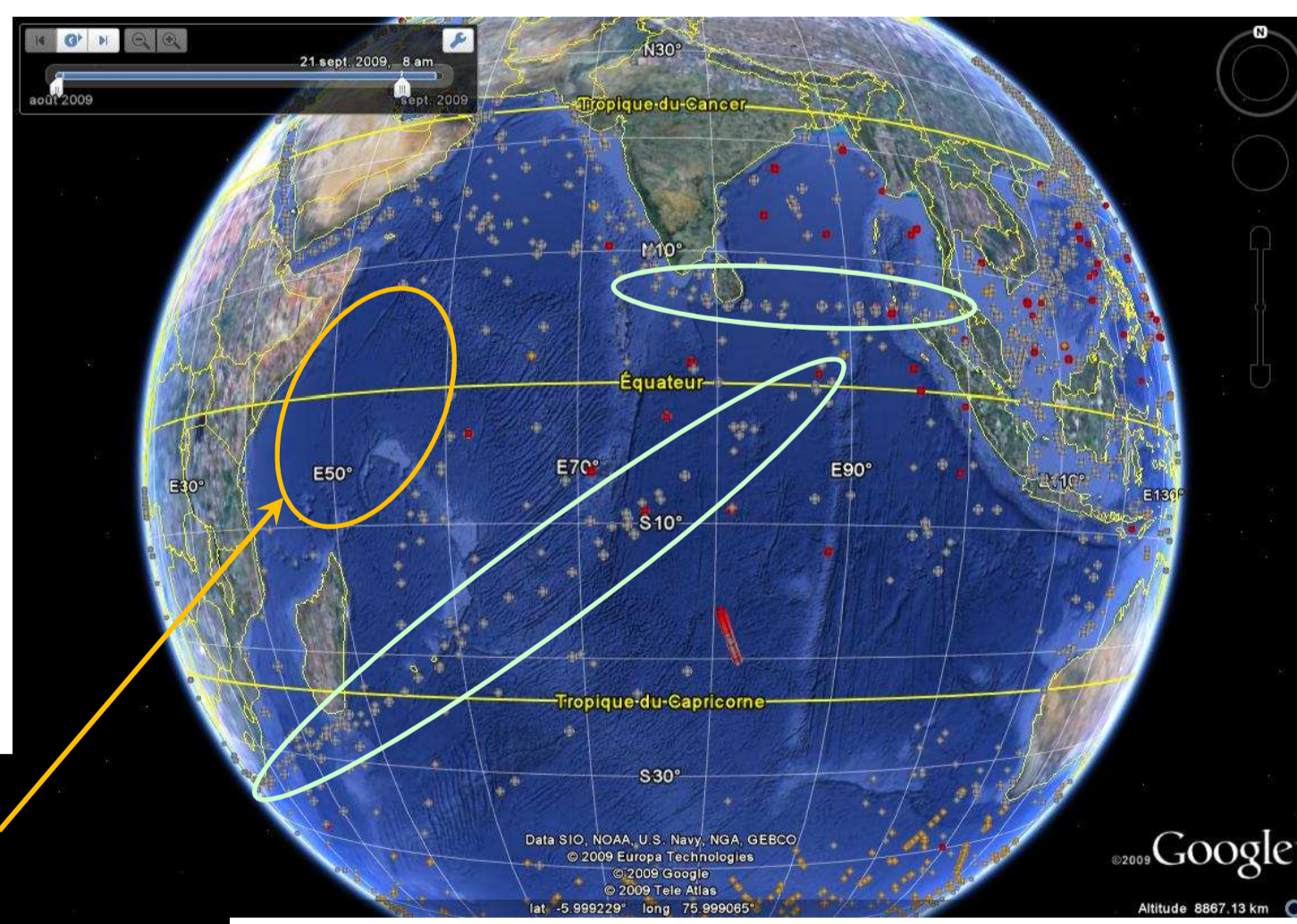
SOME NON OCEAN LIKE WAVEFORMS

Editing of data with non ocean-like waveform:

→ aligned on shipping routes

Reflector = ships

Piracy area (no ship detection)



DETECTIONS STATISTICS

