

## **Advanced Discriminants for Explosive Hydroacoustic Phases**

The enforcement of the Comprehensive Nuclear-Test Ban Treaty (CTBT) requires the monitoring of acoustic sources in the oceans in order to detect underwater explosions. We present new advanced criteria used to discriminate hydroacoustic phases between explosive events and earthquakes. These criteria can be applied on records from both hydrophones and “T-phase” seismic stations. In the time domain, and in addition to the classical amplitude/Duration discriminant, we use a catalogue of reference envelopes to which a signal can be directly compared by cross-correlation algorithms. In the frequency domain, we use several methods including: the study of the decay of spectral amplitude with frequency (both in terms of a power law, and of smoothness), and the evolution of the duration of the signal when corrected using an empirical compensation of any frequency dispersion present in its Fourier spectrum. We show that a combination of these various methods allows the correct identification of the nature of all sources in a large dataset of more than 300 signals. We further discuss methods to improve the calculation of the period of a pulsating bubble on signals from “T-phase” seismic stations.

**Primary author:** HYVERNAUD, Olivier (Laboratoire de Geophysique de PAMATAI)

**Presenter:** HYVERNAUD, Olivier (Laboratoire de Geophysique de PAMATAI)

**Track Classification:** Theme 2: Events and Their Characterization