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ARROW (AtmospheRic InfRasound by Ocean Waves): a new real-time product for global ambient noise monitoring.

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Between 0.1 and 0.6 Hz, the coherent ambient infrasound noise is dominated worldwide by signals originating from the ocean, the so-called microbaroms. With an energy peaking around 0.2 Hz, microbaroms signals are generated by second order non linear interactions between wind-waves at the ocean surface and are able to propagate all around the globe through the stratosphere and thermosphere. Monitoring these signals allows characterizing the source activity and probing the properties of their propagation medium, the middle atmosphere, assuming that the source is well modelled. A new theoretical description of the mechanism signal generation connecting the amplitude of the pressure signal to the height and frequency wave oscillation has been proposed by De Carlo et al. (2020). This model has been evaluated quantitatively through systematic comparisons with worldwide observations (De Carlo et al., 2021). This model has been implemented by the Laboratoire d'Océanographie Physique et Spatiale (LOPS) research unit of IFREMER in the DATARMOR HPC center (11088 cores - 426 Tflops) which allows big data hosting and intensive computation. We present a technical overview of the ARROW product and its implementation framework for both hindcast and real-time production. In the context of the future verification of the Comprehensive nuclear Test Ban Treaty (CTBT), ARROW offers an opportunity to target infrasonic signals of specific interest interfering with the global ambient coherent noise. This product, based on a state-of-the-art numerical wave model, paves the way for improved medium-range weather forecasting, by building a global and time-dependent reference database used as input to develop innovative remote sensing methods.