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## Application of Template Matching to OBS array observation in Orca Volcano (Bransfield Strait, Antarctica)

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The temporary seismic network deployed from January 2019 to February 2020 in the Bransfield Strait as part of the BRAVOSEIS project has enabled the development of an earthquake catalogue for Orca submarine volcano. A STA/LTA algorithm, manual picking, and the HYPO71 location algorithm with a 1-D model based on previous studies was used to create a catalogue of 4988 earthquakes. The seismicity was characterized by low magnitude events ( $-1 < M_L < 2.7$ ) occurring mainly in the upper five-kilometers around Orca caldera. Declustering using the Gardner and Knopoff method, reduced the catalogue size by nearly 90%. The declustered catalogue is complete above a magnitude  $M_L$  of 0.9 and the estimated b-value for the whole period studied is  $1.03 \pm 0.18$ . Because of the noisy the oceanic environments, building the catalogue became an arduous task to perform manually even with a STA/LTA algorithm. Having catalogued such a numerous microseismic events and with the goal of enhancing the catalogue, we apply a super-efficient cross-correlation (SEC-C) method on the continuous network dataset. The effectiveness of SEC-C is soon corroborated by analysing the output of this template matching-based detector. A volcano-tectonic swarm previously catalogued manually between July and August 2019 is clearly identified by the preliminary results of the SEC-C method. The thresholds we imposed for the cross-correlation values and signal-to-noise ratios considered for the workflow from event detection to location were chosen to make the method as 'blind' as possible. More than six hundred events have been incorporated after the template matching procedure, considerably augmenting the catalogue.