Characteristics of the SHAPES algorithm applied to glider data during Antarctic surveys in 2018/19 and data analysis notes.

We used Echoview (Echoview Software Pty. Ltd., v 11.0) to process raw acoustic data that were previously linked to the glider navigation data by time stamp. The first three meters from the transducer face was removed as well as five meters from the ocean floor. Data where the glider was diving at an angle less than 10 degrees or greater than 30 degrees was also removed. Raw acoustic data from each frequency were cleaned of noise using Echoview’s Background Noise Removal (De Robertis and Higginbottom 2007), Impulse Noise Removal, and Transient Noise Removal (Ryan et al. 2015) algorithms. We then applied the SHAPEs (Coetzee, 2000) algorithm in Echoview to define krill schools using a dilation 3x3 filter on the cleaned data. School detection parameters were based on Guihen et al. (2014) but we used a threshold of -75 dB and selected a minimum school length of 7.5m (Supplementary Table 1). After schools were defined, all data not defined as schools was set to empty water and the mean volume backscattering strength (MVBS or $\overbar{S}\_{v}$, dB) and area backscatter coefficient (ABC or *sa*, m2 m-2) from the 125 kHz echosounder were exported in 1 m x 1 m bins for further processing in MATLAB.

**Supplementary Table 1**. Characteristics of the SHAPEs algorithm used to identify krill patches in this study and in Guihen et al. (2014).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Minimum total school length (m) | Threshold (dB) | Minimum total school height (m) | Minimum candidate length (m) | Minimum candidate height (m) | Maximum vertical linking distance (m) | Maximum horizontal linking distance (m) |
| This study | 7.5 | -75 | 2 | 1.5 | 2 | 2 | 3 |
| Guihen et al (2014) | 15 | -70 | 2 | 1.5 | 2 | 2 | 3 |