

{rokbox title=|Denoising of the 18 and 38kHz :: Image: M. Peña (COB-IEO)|
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M. Peña, 2016. [Incrementing data quality of multi-frequency echograms using the Adaptive Wiener Filter \(AWF\) denoising algorithm](#) . Deep Sea Research Part I: Oceanographic Research Papers. Volume 116, October 2016, Pages 14–21

Abstract: Achieving acceptable signal-to-noise ratio (SNR) can be difficult when working in sparsely populated waters and/or when species have low scattering such as fluid filled animals. The increasing use of higher frequencies and the study of deeper depths in fisheries acoustics, as well as the use of commercial vessels, is raising the need to employ good denoising algorithms. The use of a lower Sv threshold to remove noise or unwanted targets is not suitable in many cases and increases the relative background noise component in the echogram, demanding more effectiveness from denoising algorithms. The Adaptive Wiener Filter (AWF) denoising algorithm is presented in this study. The technique is based on the AWF commonly used in digital photography and video enhancement. The algorithm firstly increments the quality of the data with a variance-dependent smoothing, before estimating the noise level as the envelope of the Sv minima. The AWF denoising algorithm outperforms existing algorithms in the presence of gaussian, speckle and salt and pepper noise, although impulse noise needs to be previously removed. Cleaned echograms present homogenous echotraces with outlined edges.

Keywords: Echogram noise, AWF denoising, TVG, Local variance