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Poster
The first baroclinic Rossby radius in the Southern Ocean is estimated to be as small as 10 to 20 km (implying eddies with a typical diameter as small as 60 km). Features on these lengthscales can be difficult to detect, either from traditional hydrographic sampling or from gridded altimetric products, which typically smooth over 100-200 km lengthscales. In Drake Passage, the US Antarctic supply vessel ARSV Laurence M. Gould traverses Drake Passage approximately 20 times per year, and since 1999 on each crossing the ship has collected acoustic Doppler current profiler (ADCP) with horizontal resolution of 5 km. These ADCP observations provide a valuable tool for assessing wavenumber spectra in the Southern Ocean and for evaluating the open ocean performance of high wavenumber altimeter products (such as those designed to capture small scale features in coastal regimes) and may eventually help evaluate newer altimeters designed to provide higher spatial resolution data (e.g. AltiKa or Cryosat). In Drake Passage, ADCP data consistently indicate velocity spectra with spectral slopes of -3, in agreement with ADCP-derived velocity spectra computed in other energetic regions. In the mixed layer, where wind and waves may influence velocities, spectral slopes are slightly flatter (-2.5), and in the thermocline spectral slopes are about -2.7. These spectra are somewhat steeper than analogous spectra computed from altimetric products.
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