The effects of vertical interpolation techniques on the estimates of oceanic change

Paul Barker and Trevor McDougall

UNSW Australia, School of Mathematics and Statistics, UNSW Sydney, Australia (paul.barker@unsw.edu.au)

Oceanic data often consists of salinity and temperature measurements made at discrete irregular pressures in the water column. In order to maximise their use oceanographers typically interpolate these samples to regular pressure intervals. We present a method for interpolating hydrographic data that minimises watermass creation and destruction. This is achieved by applying a piecewise cubic Hermite interpolating polynomial (pchip) to salinity and temperature with bottle number as the vertical interpolating co-ordinate. Use of this vertical interpolating coordinate is equivalent to interpolating in the salinity-temperature diagram and is essential for avoiding the production of anomalous water masses which otherwise occurs by interpolating in pressure (or depth) space.