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# Global hydrographic variability patterns during 2003-2007

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Global temperature and salinity fields from the near surface layer down to 2000m depth based on ARGO measurements are used to analyze large-scale variability patterns on annual to interannual time scales as they are derived from the monthly mean values during the years 2003-2007. Previous estimates of global hydrographic fluctuations have been created using different data sets, partly based on scarce sampling. The substantial advantage of this study includes a detailed summary of annual to interannual variability patterns of the global ocean based on a single and more uniform data base. The dominant signal of upper ocean variability is the annual cycle characterized by a clear hemispheric asymmetry with strongest amplitudes in the northern hemisphere where changes of the annual signal from year to year are strong. Annual amplitudes of the salinity field play an important role in the near surface tropical and subpolar parts of the global ocean. The dominant harmonic of the global temperature field increases at mid-latitudes from the surface down to more than 300m depth and amplitudes are subsurface intensified in the tropical basin. At mid-latitudes in the area of the subtropical and subpolar fronts, interannual anomalies show a deep baroclinic component down to more than 1500m depth in all three ocean basins. In the tropical basins, dominant patterns of baroclinic variability are mostly confined to the upper 500m depth. However, the dominant signatures of global interannual variability occur in the equatorial band and between 5-10°N during the years 2003-2007. A global estimation of long-term changes of heat and salt content as well as of steric height are derived from the gridded field. Heat content and steric height changes are clearly associated with a positive trend during the 5 years of measurements whereas changes of salinity content are low, indicating a weak freshening tendency from the years 2003 to 2007.