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## A recent 39-year record of the stable hydrogen and oxygen isotope ratios on the Pine Glacier ice divide, West Antarctica

### Content

Ice core records of stable water isotopes ratios are known to store valuable information about the previous climate. This work discusses the isotopic record of a shallow firn core drilled near the Pine Island Glacier ice divide on the West Antarctic Ice Sheet ( $79^{\circ}55'S$ ,  $94^{\circ}21'W$ ; 2,100 m a.s.l.), during the 2015 Brazilian Traverse to WAIS. This core, TT07 (19.12 m or 9.31 m w. eq. depth), was drilled using the Mark III coring system (Kovacs Inc., USA), and melted after the field campaign, into discrete samples at 2-3 cm resolution using the Climate Change Institute, CCI, University of Maine (USA), continuous melting system (Osterberg et al., 2006). In total, 724 samples were produced and analyzed at the Centro Polar e Climático Stable Isotopes Lab (UFRGS, Brazil). The isotope data were obtained using a wavelength-scanned cavity ring-down spectroscopy (WS-CRDS) analyzer (model L2130-i, PICARRO® Inc., USA). The accuracy of the isotopic analysis was better than 0.2‰ and 0.9‰ for  $\delta^{18}O$  and  $\delta D$ , respectively. The 19 m record covers approximately 39 years with an estimated error of  $\pm 1$  year (1975–2014), showing marked seasonal variability. The mean isotopic composition was  $-36.45 \text{‰} \pm 2.04 \text{‰}$  for  $\delta^{18}O$ ,  $-287.92 \text{‰} \pm 17.03 \text{‰}$  for  $\delta D$  and  $3.7 \text{‰} \pm 1.9 \text{‰}$  for d-excess. The slope of the co-isotopic relationship is close to that of the Global Meteoric Water Line (GMWL; Craig, 1961) for the core: 8.31, consistent with other firn core results obtained in this area. We also found an average accumulation rate of 0.23 m w. eq.  $y^{-1}$ . The TT07  $\delta^{18}O$  and  $\delta D$  data reflect the same circulation anomalies that have contributed to the trends in temperature, sea ice and the ocean circulation changes of the past years. We present in this work the cross-correlation between the isotopic signal and accumulation records from TT07 and the time series of the SAM index, multivariate ENSO index (MEI) and sea ice extent (SIE). The results obtained will help the interpretation of the Brazilian 92 m ice core recovered in this area.

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