



## **A higher storage of anthropogenic carbon in the Indian Ocean?**

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For the first time in March-April 2002 a full-depth high-resolution 32°S transindian section was sampled for CO<sub>2</sub> variables: pH, alkalinity (TA) and some total inorganic carbon (TIC) for internal consistency control. The main goal of this project was to measure the meridional overturning circulation in the southern boundary of the Indian Ocean. On the other hand, the 2002 CO<sub>2</sub> data will allow the first direct estimation of anthropogenic carbon (CANT) in the subtropical Indian Ocean and eventually enable us to close the CANT budget in this ocean. In this work we present, compare and discuss the CANT inventory along 32°S following different techniques: three back-calculation techniques, Sabine et al. (1999), Lo Monaco et al. (2005) and the TrOCA method (Touratier et al, 2007). We present two modifications to the Sabine et al. (1999) improving the preformed TA and the preindustrial preformed TIC estimation. The Lo Monaco et al. method yields higher CANT specific inventories, then the Sabine et al. and finally the TrOCA method. The inventories will be discussed by water masses, as deep waters with a southern origin could have some CANT signal as pointed out by tracers. The discrepancies arise from the assumptions in each method to estimate the biological contribution and the preindustrial preformed TIC or in the case of Sabine

et al. the so called disequilibrium. As not data-based methods, we will be comparing the transient time distribution (TTD) method applied to CFC-11, 12 and CCl<sub>4</sub> and the results from a general circulation ocean model to estimate CANT. One of the main questions is whether the CANT inventory in the Indian Ocean has been previously underestimated and which are the strengths and drawbacks of each method.