On The Brazil Current System off Southeast Brazil (24°S): Top - Bottom Direct Velocity Measurements

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flow pattern of the BC System is mainly baroclinic (up to 75-80%) off Southeast Brazil.

Introduction

The BC or BC-IWBC System off 23-24°S Brazil (Figure 1) comprises the BC flowing southwestward at surface and the IWBC flowing northeastward in intermediate depths. At these latitudes the BC-IWBC System is mainly baroclinic (Silveira et al., 2004). Most estimates of its volume transport and studies are based on geostrophic calculations. Direct velocity measurements of the BC-IWBC System using L-ADCP are unprecedented.

Goals

Our goals are to describe the CB-IWBC system flow pattern off 24°S and the relative importance of the barotropic and baroclinc velocity components using top-bottom direct velocity measurements.

The CERES Experiment

Figure 2: Cross-Section Observed Velocities: (a) Velocities measured with L-ADCP; (b) Velocities measured with Vessel Mounted ADCP. The white numbers indicate transports and maximum velocities of the BC-IWBC System. The black triangles represent the L-ADCP casts' positions.

Modeled and Observed Baroclinic Velocities:



The data set used in this work was collected during the fourth survey of the CERES Experiment (CERES IV, see Figure 1). This experiment is a set of four surveys which were conducted by the Ocean Dynamics Laboratory from the Oceanographic Institute of University of São Paulo (IOUSP) and funded by Petróleo Brasileiro S.A. (PETROBRAS).



The CERES IV conducted by R/V Antares (Brazilian Navy). The red dots represent the Figure 1: location of top-bottom direct velocity measurements using L-ADCP. The black rectangle indicates the data employed in this work.

Methodology

• L-ADCP data precessing: methodology described by Fischer &

Figure 3: Cross-Section Baroclinic Velocities: (a) Baroclinic velocities measured with L-ADCP; (b) Baroclinic velocities estimated with POMxz; (c) Diference between the velocities fields (a) and (b). The white numbers indicate transports and maximum velocities of the BC-IWBC System. The black triangles represent the L-ADCP and CTD casts' positions.

Final remarks

• The BC-IWBC System observed velocities are similar to that modeled with POMxz (Figure 3) but differ in details. These differencies may be due to the sampling strategy employed; • The L-ADCP observed velocities present a BC-IWBC System mainly baroclinic corroborating Silveira et al. (2004); • The direct velocity observations shown is this work are the first L-ADCP measurements of the BC-IWBC System; These results are preliminary. The next step is to use all the CERES IV transects to obtain a 3D velocity field in Santos Bight.

References

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2VM ADCP data precessing: CODAS processing package;

³Calculation of baroclinic velocities with the sectional version of the

Princeton Ocean Model (POMxz).

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