Greenhouse Gases: Background Concentrations in Brazilian coast.

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In Tropical areas, and specifically in the Atlantic Ocean, there are not enough measures on greenhouse gases (GHG), and Amazon Basin represent around 50% of the world's rainforest [1]. Understand the characteristic GHG concentrations in Tropical Global range on Atlantic Ocean is an important task for many studies to determine GHG balances. The motivation of this study was understanding better the typical background for Amazon Basin from the air masses that arrived on North and Northeast Brazilian coast, come from the Atlantic Ocean in the period 2006 to 2016. We started to collect air samples on the Brazilian coast: Arembepe/BA (ABP: 12º45'46.79"S; 38º10'08.39"W – from 2006 to 2010, 15 meters above sea-level), Salinopolis/PA (SAL: 00º36'15.03"S; 47º22'25.02"W – from 2010 to 2017, 10 m a.s.l.), Natal/RN (NAT: 05º29'22.05"S; 35º15'39.64"W 15 m a.s.l – since 2010 to December 2015, then the site moved to 05º47'42.77"S; 35º11'07.10"W, 87 m a.s.l.), Camocim/CE (CAM: 02º51'47.00"S; 40º51'36.70"W – since 2014, 21.5 m a.s.l.), and in December 2016 it was started a special place at Itarema/CE (ITA: 02º55'57.11"S; 39º50'38.49"W, 96.5 m a.s.l.), where the inlet was installed in the top of a 100 m tower in the beach. In each site, the air samples, with variable height were collected weekly by using a pair of glass flasks (2.5L) and a portable sampler. The air samples were analysed on the Greenhouse Gas Laboratory (LaGEE) at IPEN (until April 2015) and later at INPE/CCST. It was quantified the respective gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6) and carbon monoxide (CO). Results showed that each site presents seasonality when compared to Ascension Island (ASC: 07º96'67.00"S; 14º0'00.00"W, South Atlantic Ocean) and Ragged Point Barbados (RPB: 13º16'50.00"N, 59º43'20.00"W, North Atlantic Ocean) global stations. Simulations of backward trajectories by HYSPLIT model (using 240 hours) [2], allowed observing how each study site is influenced by global circulation and process like Intertropical Convergence Zone [3]. Between Jan-May, the ITCZ is below SAL and CAM latitude, influencing the air masses that arrived at sites in this period. At SAL and CAM the air masses came from both North and South Atlantic Ocean, depending on time of the year, and at NAT and ABP the air masses came from only South Atlantic Ocean. The GHG concentrations showed seasonality and sometimes periods with high concentrations. Overall, all Brazilian coast sites, showed the same increase on the GHG concentrations than global mean.

Acknowledgment: CNPq, NERC, FAPESP, MCTI, NOAA, Marinha do Brasil, Eólicas Itarema, IPEN and INPE.

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