

## A12 STUDY OF SF<sub>6</sub> CONCENTRATIONS IN AMAZON BASIN AND BRAZILIAN COAST

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SF<sub>6</sub> is one of the most potent greenhouse gases known. Its surface fluxes include anthropogenic emissions from applications in industry and very minor uptake by the oceans. SF<sub>6</sub> is inert throughout the troposphere and stratosphere and is slowly photolyzed in the mesosphere, resulting in an estimated atmospheric lifetime of 3200 years<sup>1</sup>. Our interest in SF<sub>6</sub> concentrations is to use this gas as a transport tracer to calculate CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O fluxes over the Amazon Basin. SF<sub>6</sub> atmospheric measurements were started with vertical profiles using small aircrafts, since 2000 in Santarém (SAN; 2.86°S; 54.95°W), 2009 in Rio Branco (RBA; 9.38°S, 67.62°W), 2010 in Alta Floresta (ALF; 8.80°S, 56.75°W) and Tabatinga (TAB; 5.96°S, 70.06°W), all these sites located in Brazilian Amazon Basin. Since 2010, we started flask measurements at two sites located at the Brazilian Atlantic coast: in Salinópolis (SAL; 0.60°S, 47.37°W) and in Natal (NAT; 5.48°S, 35.26°W). The purpose of this study is to present and discuss these measurements. Consistent with other existing records our results show that SF<sub>6</sub> concentrations increased nearly 3.3ppt (71%) between 2000 and 2013, with a mean increase rate of 0.25ppt per year. The concentrations at all our stations are generally similar to other Southern Hemisphere records with the exception of the January to April period for SAL and SAN and the January to March period for RBA, ALF and TAB when concentrations are more similar to Northern Hemisphere records. Examination of air parcel paths using HYSPLIT<sup>2</sup> for these periods confirmed that some air parcels arriving at these stations have travelled from the Northern Hemisphere to the sites. The NAT concentrations differ and are all year round influenced entirely by Southern Hemisphere air. Finally there are no significant differences between coastal and inland stations confirming the absence of SF<sub>6</sub> sources in the Basin.

### References:

1 Ravishankara, A.R.; Solomon, S.; Turnispeed, A.A.; Warren, R.F., Atmospheric lifetime of long-lived halogenated species, *Science*, 259, 194–199, 1993.

2 Draxler, R.R. and G.D. Rolph (2013), HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) Model access via NOAA ARL READY Website (<http://ready.arl.noaa.gov/HYSPLIT.php>), NOAA Air Resources Laboratory, Silver Spring, MD.

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