

Overview of Sprite Campaigns in Brazil

Fernanda São Sabbas¹, Michael J. Taylor², Dominique Pautet¹, Matthew Bailey², Natalia N. Solorzano³, Jeremy N. Thomas^{4,5}, Robert H. Holzworth⁴, Steven A. Cummer⁶, Osmar Pinto Jr.¹, Sharon Vadas⁷, Peter Stamus⁷, David C. Fritts⁷, Nelson J. Schuch⁸, Vinicius T. Rampinelli¹, and Micael S. Bacellar⁹

¹ National Institute for Space Research - INPE, São José dos Campos, SP, Brazil

² Utah State University - USU, Logan, UT, United States

³ Digipen Institute of Technology, Redmond, WA, United States

⁴ University of Washington - UW, Seattle, WA, United States

⁵ Geomagnetism Program, USGS, Denver, CO

⁶ Duke University – DU, Durham, NC, United States

⁷ Colorado Research Associates – CoRA/NWRA, Boulder, CO, United States

⁸ Southern Regional Space Research Center-CRSPE/INPE, Santa Maria, RS, Brazil

⁹ Universidade Federal de Santa Maria - UFSM, Brazil

The first sprites documented above Brazil were recorded from space during the Mesoscale Lightning Experiment, MLE, onboard the Space Shuttle between 1989 and 1991. Nine years later, in 2002, ground-based and airborne observations of sprites were performed in Brazil for first time. The scientific campaign, in the Southeastern Region, resulted from a collaborative effort of INPE, University of Washington and Utah State University entitled "In-Situ Electrodynamics Over Sprite Producing Storms". Eighteen TLEs, sixteen sprites and two halos, were recorded from the ground and from onboard INPE's small airplane, during three different nights. These observations were the confirmation that TLEs do occur above Brazilian thunderstorms. Fourteen TLEs were recorded in 2005 during one night of the second campaign at the Central-West Region. Also a result of international collaboration, the observations were part of a larger effort to investigate a possible role of gravity waves on sprite and spread-F seeding. Several Brazilian and US research institutions were involved and supported by an INPE project sponsored by FAPESP and a Colorado Research Associates project sponsored by NASA. The third campaign in 2006 was a continuation of the first one, this time performed in Southern Brazil. Up to date a total of four sprite campaigns took place in different regions of Brazil, the first three were a direct result of international collaboration, and the last one was the first Brazilian effort. This paper will present a brief overview of these campaigns with focus on the third, the one with most impressive results, more than 500 events recorded above two thunderstorms over Argentina in 2006, and the last campaign, in 2007, when 27 sprites were recorded with Brazilian instrumentation for the first time.