

VALIDATION OF AEOLUS L2B WIND PRODUCT AT PORTO VELHO - BRAZIL

Alexandre C. Yoshida^{1,2}, Fábio J.S. Lopes^{2,3}, Patricia C. Venturini¹, Alexandre Cacheffo¹, and Eduardo Landulfo²

¹ Instituto de Ciências Exatas e Naturais do Pontal - ICENP, Universidade Federal de Uberlândia - UFU, Ituiutaba - MG, Brazil

² Centro de Lasers e Aplicações, Instituto de Pesquisas Energéticas e Nucleares - IPEN, São Paulo - SP, Brazil

³ Instituto de Ciências Ambientais, Químicas e Farmacêuticas, Universidade Federal de São Paulo - UNIFESP, Diadema - SP, Brazil

Contact: alexandrecalzavara@gmail.com

Abstract

The Atmospheric Dynamics Mission ADM-Aeolus was successfully launched in August 2018 by the European Space Agency (ESA). The Aeolus mission carried a single instrument, the first-ever Doppler Wind Lidar (DWL) in space, called Atmospheric LAsER Doppler INstrument (ALADIN). Circling the Earth in a polar sun-synchronous orbit at about 320 km altitude and a repeat cycle of 7 days, ALADIN operated at an ultraviolet (UV) wavelength of 355 nm, at a frequency of 50 Hz, providing vertical profiles of horizontal line-of-sight (HLOS) winds on a global scale. Aeolus's mission exceeded scientific expectations, initially designed for a 3-year lifetime, providing global coverage of wind profiles for almost five years. At the end of April 2023, the satellite initiated the assisted reentry process, and on July 28, 2023, it safely burned up upon reentering the Earth's atmosphere over Antarctica. In this study, we assessed the accuracy of the L2B wind products by collecting radiosonde data from the Porto Velho station in the North Region of Brazil (8.76 S, 63.91 W). The Aeolus satellite passed over the station twice weekly in two different orbits: the descending orbit at 10:04 UTC on Thursdays and the ascending orbit at 22:25 UTC on Saturdays. In this long-term validation, we focus on the descending orbit overpasses, comparing Aeolus L2B wind products and radiosondes launched daily at 12:00 UTC. Statistical validation was performed from October 2018 to March 2023, encompassing the entire period of the Aeolus mission.

Keywords: Aeolus; L2B wind product; statistical validation.

XII WLMLA Topic: Satellite remote sensing

ID: Oral OP-SRS-03