

# FOUR-YEAR PROPAGATION RESULTS FROM THE ASI ALPHASAT GROUND STATIONS IN TITO SCALO AND SPINO D'ADDA

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## Abstract

The Alphasat Aldo Paraboni experiment (in memory of the late professor of Politecnico di Milano who greatly contributed to conceive and realize it) is the most recent initiative of ASI, in collaboration with ESA, aiming at characterizing the radio communication channel at Ka band and Q band for the design and operation of future High Throughput Satellite systems. The Alphasat Aldo Paraboni experiment features two beacons at Ka (19.701 GHz) and Q (39.402 GHz) band, respectively hosted aboard the Alphasat geosynchronous satellite (max orbit inclination equal to 3 degrees), operated by INMARSAT for its commercial services. The ASI Alphasat ground stations of Tito Scalo (South of Italy) and Spino d'Adda (North of Italy), equipped with a monopulse auto tracking system, measure the co-polar signal at 19.701 and 39.402 GHz with a 4.2 m diameter antenna at an average elevation angle of 42.1° (Tito Scalo) and 35.5° (Spino d'Adda). A 16-Hz sampling rate is implemented to characterize scintillation effects, with a dynamic range of more than 50 dB. A profiler radiometer (RPG-HATPRO, a tipping bucket rain gauge and an ancillary meteorological station complete the equipment of both stations. This contribution presents four years (2015 and 2017-2019) of attenuation and rain intensity statistics collected in the above two ASI ground stations. Both first-order and second order statistics will be presented and comparisons with prediction models will be carried out.