Recent Advances in the Cubatão Scanning Lidar to Monitor Industrial Flares

J. L. Guerrero-Rascado[1,2,3]

(1) nstituto Interuniversitario de Investigación del Sistema Tierra en Andalucía (IISTA-CEAMA), Av. del Mediterráneo, 18006, Granada, España

(2) pto. Física Aplicada, Universidad de Granada, Fuentenueva s/n, 18071, Granada, España

(3) entro de Lasers e Aplicações, Instituto de Pesquisas Energéticas e Nucleares (IPEN), Avd. Prof. Lineu Prestes 2242, 05508-000, São Paulo, Brasil

R. F. da Costa[3], A. E. Bedoya[4], R. Guardani[5], L. Alados-Arboledas[1,2], A. E. Bastidas[4] and E. Landulfo[3]

(4) scuela de Física, Universidad Nacional de Colombia, Calle 59ª Nº 63-20, Medellín, Colombia

(5) Dpto. Engenheria Química, Universidade de São Paulo, Av. Luciano Gualberto, 380 Trav. 3, 05508-900, São Paulo, Brasil

rascado@ugr.es

Abstract: This study present the recent advances made on a multiwavelength elastic scanning lidar placed at the industrial area of Cubatão in the State of São Paulo (Brazil). Special attention has been paid to the characterization of the instrumental performance of this lidar system, in particular regarding to its electronic subsystem. To this aim, the quality assurance tests, regularly applied in well-established lidar networks such as LALINET and EARLINET, were applied to the Cubatão scanning lidar in order to improve the knowledge of its performing itself and to design protocols for correcting lidar signal for undesirable instrumental effects. In particular, the trigger delay was assessed by means of zero-bin and bin-shift tests for analog and photo-counting signals, respectively. Dark current test is also performed to detect potential range-dependency that could affect lidar products. The application of the results derived from these tests together with the state-of-the-art methodologies to characterize the particle optical and microphysical properties inside industrial flares demonstrate the potential of this lidar for the study and measurement of industrial emissions.

Keywords: EARLINET protocols; dark current; instrumental tests; LALINET protocols; lidar; trigger delay; flame optical properties; flame microphysical properties

VIII WLMLA Topic: Remote Sensing applications