

## COMPARISON OF TWO DISDROMETERS BASED ON DIFFERENT PRINCIPLES

C. Caracciolo (1), S. Natali (3), F. Prodi (1)(2), A. Tagliavini (4)

(1) Department of Physics-University of Ferrara, Ferrara, Italy

(2) ISAC-CNR Cloud and Precipitation Group, Bologna, Italy

(3) Nubila S.a.s., Via Zago 2, Bologna, Italy

(4) A.D.A. (Applicazioni Digitali e Analogiche), Bologna, Italy

Accurate measurements of Drop Size Distributions (DSDs) are fundamental in the physics of the clouds and precipitations for the study of the processes that determine and modify the raindrop size distributions. Our objective is to compare the performance of two sensors that measure DSDs using different principles. Estimates of rainfall amounts are also compared. The two instruments are a Joss-Waldvogel disdrometer (JW) and PLUDIX (raingage-disdrometer in X-band, 9.5 GHz). Rainfall rates were also measured by a tipping-bucket rain gauge. They were operated during the winter of 2001 at the Department of Physics-University of Ferrara. Two rainfall events and three snow events were recorded. The effect of various calibration approaches between JW and PLUDIX was studied. We also assessed the agreement between the two sensors in DSD and rainfall-rate measurements. It was demonstrated that the number concentration of small diameter drops is increasingly underestimated by JW as the rainfall-rate increases and that the long-time-period DSD averaged followed well a Gamma distribution. We also found that PLUDIX generally underestimates the rain with respect to the JW disdrometer and that detects very well the snow events, that JW does not see.