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Statistical analysis of coastal wind profiles – a parallel between Ahtopol at the Black Sea and Lamezia Terme at the Tyrrenian Sea

Damyan Barantiev (1), Daniel Gulli (2), Luca Tiriolo (2), Elenio Avolio (2), Ekaterina Batchvarova (1), Claudia Roberta Calidonna (2), Teresa Lo Feudo (2), Anna Maria Sempreviva (3), Nadya Neykova (1), Vanya Maneva (1), Lora Valcheva (1), and Mikhail Novitsky (4)

(1) National Institute of Meteorology and Hydrology, Sofia, Bulgaria, (2) CNR - Institute of Atmospheric Sciences and Climate, Italy, (3) Wind Energy Department, Technical University of Denmark, Roskilde, Denmark, (4) Sientific Production Association "Typhoon", Obninsk, Russia

A parallel study was performed on wind and Weibull distribution parameters profiles at a Black Sea and a Mediterranean coastal sites based on two remote sensing sensors: sodar and lidar. A SCINTEC MFAS sodar at the Bulgarian Southern Black Sea Coast (Ahtopol) and wind lidar Zephir at the Tyrrhenian coast of the Calabrian Peninsula, Italy (Lamezia Terme) were in operation simultaneously in 2014. That high spatial and temporal resolution data were explored at both places allowing a comparative study of the wind regime between the two coastal sites. The maximum vertical range of derived profiles of wind speed, direction and wind shear from lidar Zephir has been up to 300m while the mid-range acoustic sounding instrument has derived in addition turbulent profiles up to 720m. This study uses data set by wind direction (land or sea type of air masses) and by time of year (seasonality). Following the definition for extreme weather event of Intergovernmental Panel on Climate Change (IPCC), the annual extreme wind speed profiles for 2014 are derived for the both sites. The study contributes to the understanding of wind regime and wind energy potential at both sites covering regions with modest observational networks, especially for vertical profiles of meteorological parameters.