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Characterisation of the urban heat island effect over Barcelona city (NE Spain)

Maria-Dolors Martinez (1), Xavier Lana (1), Carina Serra (1), and August Burgueño (2)

(1) Dept. Física, Universitat Politècnica de Catalunya, Barcelona, Spain (dolors.martinez@upc.edu, francisco.javier.lana@upc.edu, carina.serra@upc.edu), (2) Dept. Astronomia i Meteorologia, Universitat de Barcelona, Barcelona, Spain

The urban heat island over Barcelona city area is characterised by comparing three series of daily minimum temperatures recorded for the 2008-2014 period at stations located in the city centre (Raval), on the periphery of the urban area (Zona Universitària) and at Barcelona Airport (El Prat de Llobregat), in Barcelona metropolitan area. The UHI effect is quite evident when comparing El Prat and Raval series, as Raval station exhibits higher minimum temperatures than El Prat. This contrast between minimum temperatures is not so evident when comparing Zona Universitària and El Prat and, especially, for the pair Zona Universitària–Raval. The dependence of the minimum temperature differences between pairs of stations on wind velocity, wind direction and minimum temperatures recorded at these three locations is firstly analysed without distinguishing hot and cold seasons along the year. After that, the analyses are repeated taking into consideration only the cold period (October–March). Additionally, time trends on the minimum temperature difference series are also checked, being remarkable some signs of the expansion of the UHI phenomenon out of the, strictly speaking, Barcelona city area.