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A Satellite Time Slots Climatology of the Urban Heat Island of Guadalajara Megacity in Mexico from NOAA ¡/AVHRR THERMAL Infrared Monitoring (TIR)

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ABSTRACT
The urban heat island (UHI) of the metropolitan area of the second megacity of Mexico, named Guadalajara in Mexico is studied using thermal infrared data (TIR) (10 £ l £ 12 mm) obtained from the Advanced Very High Resolution Radiometer (AVHRR) on board the NOAA polar orbitters whose signals are received on real time at our ground station for the period 1996-2006. The TIR data are selected by means of a software, since they depend on natural causes (e.g., atmospheric transparency, surface temperature, spectral emissivity and topography) and observational (time and incidence angle of the satellite pass, season of the year, etc.). The above conditions have a variable contribution to the measurements which it can be so high that they simulate the temporal-space fluctuations considered as thermal anomalies. Using a Geographic Information System and spatial analysis techniques temperatures are obtained for diofferent times of the day (satellite slots) and dropped into a grid with a 2.5 km distance between points (latitude, longitude). The temperatures obtained for each satellite pass slot (four per day) are monthly averaged and the temperature anomalies are represented in thermal isolines for the study area. The temperature difference usually is larger at night than during the day, reaching a thermal gradient of 9 °C.