Temporal and spatial changes of statistical properties in the urban seismic noise wavefield

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Within the Collaborative Research Center 461 (CRC461) 'Strong Earthquakes' the URban Seismology (URS) experiment was carried out in Bucharest, Romania from October 2003 to August 2004. URS was accomplished with the mobile KArlsruhe BroadBand Array (KABBA) owned by the Universität Karlsruhe (TH), Germany. The 31 stations were operated at 34 different sites in the metropolitan area of Bucharest. The stations were mainly equipped with STS-2 broadband seismometers with a fundamental period of 120 seconds. The continuous recording of the ground motion velocity was done at 100 Hz sampling rate with EarthData recorders. The stations were mainly located in cellars of private and public buildings with a dense spatial distribution also covering the inner city of Bucharest. The URS dataset is capable to analyse the urban seismic noise (USN) in the frequency range from 8 mHz to 45 Hz. Within a comprehensive analysis of the USN in Bucharest a statistical approach was realised to quantify and describe USN in the time domain. The 95.45-percentiles of the noise amplitudes during 3-4 h long time series were determined. To consider the variability of the USN caused by transient or periodic signals, each time series is classified based on their probability density function. Basic principle of the classification is the phenomenon described by the central limit theorem. As a superposition of many signals from different sources, seismic noise is a realisation of a stochastic process with normal distribution in ideal case. Discrepancies from the normal distribution are not accidentally and can be used to classify time series of USN. I will present significant temporal and spatial changes of USN statistical properties observed in the metropolitan area of Bucharest, Romania. Furthermore I will highlight the relevance and impli-

cations of these observations for the monitoring of Earth's properties in the future.