



Analysis of environmental characteristics on urban road-surface and air temperatures in Seoul: A case study during heat wave days

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High road-surface temperature due to heat waves can lead to dangerous driving conditions such as tire blowouts and deformation induced by thermal stress on the roads. In this study, the dataset of Mobile Observation Vehicle (MOVE), with high spatial and temporal resolutions for the heat wave episode that occurred on 16-17 August 2018, is used to understand environmental characteristics on urban road-surface and air temperatures in Seoul. That episode has massive layer of high-pressure consisting of the Tibetan High in the upper troposphere and North Pacific High in the lower atmosphere in addition to the influence of Typhoon 'Rumbia', which eventually results in the intensification of heat wave. This study demonstrates that the magnitude of urban road-surface temperature is dependent on the differences in incoming solar radiation due to screening of high-rise buildings in the Gangnam area, and is associated with the topographical features in the Gangbuk area. The road-surface temperature in the section of darker-colored asphalts was higher than that of lighter-colored asphalts with a mean difference of 6.8°C, and both surface and air temperatures on the iron plate were highest, with means of 51.7°C and 35.1°C, respectively. In addition, during the water-sprinkling period, road-surface temperature was cooled by about 8.7°C (19%) compared with that in the period without water-sprinkling, but there was no significant change in air temperature. The current results could be practically used to improve road-surface temperature prediction models for civil engineers or road managers.