دانشگاه علوم پزشکی و خدمات بهداشتی درمانی تهران

بسمه تعالی

فرم چکیده سخنرانی ژورنال کلاب دانشجویان دکترا ورودی

دانشکده بهداشت – گروه مهندسی بهداشت محیط

نام و نام خانوادگی دانشجو: معصومه حشم فیروز **شماره دانشجویی:** ۹۹۲۱۱۵۰۰۰۱

استاد راهنمای آموزشی: جناب آقای دکتر کاظم ندافی **عکس دانشجو:**

تاریخ : ۱۴۰۲/۰۴/۲۵ **ساعت:** ۱۰/۳۰

عنوان مقاله :

Quantifying factors affecting contributions of roadway exhaust and non-exhaust emissions to ambient $PM_{10–2.5}$ and $PM_{2.5–0.2}$ particles

چکیده :

Traffic-related particulate matter (PM) plays an important role in urban air pollution. However, sources of urban pollution are difficult to distinguish. This study utilises a mobile particle concentrator platform and statistical tools to investigate factors affecting roadway ambient coarse particle ($PM_{10–2.5}$) and fine particle ($PM_{2.5–0.2}$) concentrations in greater Boston, USA. Positive matrix factorization (PMF) identified six $PM_{10–2.5}$ sources (exhaust, road salt, brake wear, regional pollution, road dust resuspension and tyre-road abrasion) and seven fine particle sources. The seven $PM_{2.5–0.2}$ sources include the six $PM_{10–2.5}$ sources and a source rich in Cr and Ni. Non-exhaust traffic-related sources together accounted for 65.6% and 29.1% of the $PM_{10–2.5}$ and $PM_{2.5–0.2}$ mass, respectively. While the respective contributions of exhaust sources were 10.4% and 20.7%. The biggest non-exhaust contributor in the $PM_{10–2.5}$ was road dust resuspension, accounting for 29.6%, while for the $PM_{2.5-0.2}$, the biggest non-exhaust source was road-tyre abrasion, accounting for 12.3%. We used stepwise general additive models (sGAMs) and found statistically significant ($p < 0.05$) effects of temperature, number of vehicles and rush hour periods on exhaust, brake wear, road dust resuspension and road-tyre abrasion with relative importance between 19.1 and 62.2%, 12.5–42.1% and 4.4–42.2% of the sGAM model's explained variability. Speed limit and road type were also important factors for exhaust, road-tyre and brake wear sources. Meteorological variables of wind speed and relative humidity were significantly associated with both coarse and fine road dust resuspension and had a combined relative importance of 38%and 48%. The quantifying results of the factors that influence traffic-related sources can offer key insights to policies aiming to improve near-road air quality.