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PM2.5 Emission for light duty Gasoline Vehicles in Beijing urban area

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The stricter standards for diesel vehicles will be implemented in china in the near future and the diesel trucks driving in the urban city were limited, so the contribution of gasoline cars to PM2.5 emissions may increase. The PM2.5 emissions of 20 light duty gasoline vehicles (LDGVs) were measured using an improved combined on-board emission measurement system in Beijing. We also compared the emission levels of the twenty LDGVs to the results of previous studies, and calculated the contribution of gasoline and diesel vehicles to the on-road PM2.5 emission in Beijing urban area. The PM2.5 emission factors of Euro 0 to Euro 4 were 123.9mg/km, 19.1mg/km, 6.7mg/km, 1.1mg/km, 0.16mg/km, respectively. The results show that the LDGVs PM2.5 emission factors decline significantly as the vehicle technology improves, but the LDGVs PM2.5 emission factors simulated by the models are similar as the emission level in 2001 and are constant. The Euro 0 LDGVs have similar PM2.5 emission level to the Euro 2 and Euro 3 Light duty diesel trucks. The Euro 1 LDGVs have similar PM2.5 emission level to the Euro 4 light duty diesel trucks (LDDTs). In Beijing urban area, the gasoline vehicles contribute 20%, 30.0%, 29.4% and 28.8% PM2.5 emissions at Highway, Arterials, Residential road and total Beijing urban area at the daytime (7:00-21:00), respectively. The contribution of gasoline vehicles to PM2.5 emission varies with time and place, at day time is higher than at night, at the rushing hours (7:00-8:00; 17:00-18:00) than at other hours, in the arterial road and residential road are higher than in the highway. It's very important that the resident road and arterial road are close to the place where people live, so the particles emitted from the gasoline vehicles have more important health impact when considering number, size and human health impact not only mass emissions. The European commission has added a particle number limit to its Euro 5/6 emission standards for light duty vehicles, which is worthwhile for China government to learn.