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**Numerical prediction of the effect of traffic lights on the vehicle  
noise at urban street intersections**

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Intersections of urban streets are particularly noisy locations due to the addition of the noise from vehicles at different streets, a long period of noise emission from queuing vehicles with traffic lights in red and the noise from accelerating vehicles. Besides, the traffic lights impose a modulation in the passage of the vehicles, so that the subsequent noise variability along time contributes to increase the annoyance degree. This paper presents a code especially developed to simulate both the spatial and temporal distribution of the sound pressure levels induced by the vehicle traffic in street intersections. The algorithm combines a traffic model with vehicles in dynamic motion through the domain with a model for sound propagation, based on the method of virtual images in which the determination of the location of the successive image sources was reduced to a reference horizontal plane. Sound emission from each vehicle was established according to the Harmonoise guidelines. After verifying the code predictions by comparison with measurements at several street intersections, the method was applied systematically to investigate the effect of varying the regulation parameters of the traffic lights on the Leq and L10 distributions for some particular cases.