Editorial

Virtual Special Issue: Natural Ventilation-Enabling Noise Reduction Facilities for Building Applications

Ground traffic is very often one of the major sources of noise pollution in an urbanized high-rise city. In order to limit the exposure of the residents to excessive traffic noise, various noise mitigation measures, such as roadside barriers, noise enclosures, extended podia, setbacks and *etc.*, have been adopted. However, they are not total solutions for a congested high-rise city where land areas are always in shortage as most of these measures tend to reduce the number of residential units which can theoretically be built. Roadside barriers and enclosures are massive structures, which are basically not applicable in a built-up area. The problem becomes much more acute during the urban redevelopment process, in which residential buildings are to be erected in the already compact and congested regions. Noise reduction facilities which can be attached onto the façades of high-rise buildings therefore are attractive alternative noise mitigation measures.

The strong building façades offer very high sound insulation. Noise intrusion into the indoor living spaces is mainly through weak points such as windows. In principle, closing windows can reduce most of the noise. However, this is done in the expense of indoor air quality unless fresh air is supplied to the indoor residential space through mechanical systems, consuming additional electrical energy and conflicting with sustainable city concept. Natural ventilation can also help regulate indoor air temperature in some parts of the world, reducing air conditioning load. Façade devices, which can offer sufficient acoustical protection and at the same time allow for acceptable level of natural ventilation, are most welcome nowadays as an element in green building design.

Sound insulation by building façades and natural ventilation across building façades are two very conflicting issues, and this is where the interest and challenge lie. Their tradeoff has been a long challenging problem especially when the topic of green building became hot around the turn of the millennium. Recently, there is much research effort reported in journals and international conferences regarding the use of different strategies and designs to tackle this very challenging problem. Practical implementation of these findings has also been discussed and carried out in many different places around the Globe. There are at least two main questions to be answered. Could we improve sound insulation without jeopardizing natural ventilation effectiveness or vice versa? Could we actually improve both sound insulation and natural ventilation effectiveness at the same time? We are seeking for effective façade devices which can cater for both sound insulation and natural

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ventilation for application in buildings. We temporarily name them as “natural ventilation-enabling noise reduction facilities”.

With the growing interest in this challenging worldwide issue and its importance in environmental noise control, it is timely to consolidate the state-of-the-arts of related efforts, and explore new ideas for tackling future problems which will be much more difficult than those of the present ones as more and more people will be living in cities. This forms the major objective of this Virtual Special Issue of the *Journal of Acoustics*.

Anticipating your contributions and support.

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