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## **ACTIVE NOISE CONTROL: APPLICATION TO THE COST REDUCTION OF THE UNDERGROUND VENTILATION BUILDINGS IN PARIS**

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**ABSTRACT**

For several years RATP manages a wide program for the improvement of climatic comfort and fire safety of the underground.

High flow ventilation buildings of 12 m<sup>2</sup> cross section (60 to 120 m<sup>3</sup>/s) have been made and today, in order to decrease their cost to flow ratio, RATP wants to decrease their dimensions knowing that 80% of the cost is due to the concrete. Nowadays, these dimensions are related to the passive acoustical treatment and the objective of acoustic level. The use of an active noise control system would allow a cost reduction of 30 to 40 percent because of the possible dimensions reductions. To reach this objective, specific developments were needed in two particular ways: active noise control performances and treatment of flow induced noise sources. For active noise control, numerical simulations led to the definition of the association of both active and passive silencers: their number, their dimensions and the architecture of the whole. Tests on a special wind tunnel allowed to validate the silencer concept and to determine the limits of its efficiency especially in terms of maximum flow velocity. For flow induced noise sources, experiments were leading to study the main noise sources and to test particular solutions. These experiments were performed on a hydraulic loop with a 1/20 model on which visualisations, velocity profiles and pressure measurements were performed. The final tests on a full scale ventilation building will take place in 2000.

**Note:** for more information about this work, please contact the authors.