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Vibroacoustics ■■■

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Motivation

Noise suppression has become a fundamental need of our time, in industrial as well as in urban areas. Passive means for noise suppression are effective at high and medium frequencies but are less effective for low frequencies (<200 Hz). In houses and buildings for example, the use of double glazing windows highly improves the acoustical insulation but windows remain the weak element in the noise transmission path.

Our research activity is devoted to the following problems :

▲ Structural sound radiation sensors

▲ Single Input Single Output feedback control strategy for noise radiation control

Related Contracts ↑

1996 : Région Wallonne - FIRST 3363 - Active vibroacoustic control (noise isolation) (Collaboration Glaceries Saint Roch)

1997 : Région Wallonne-Glacieries Saint Roch - Acoustic windows (convention 3512).

1998 : FNRS - Active control of sound radiation from a vibrating plate

1999 : FNRS - Sound radiation sensing and feedback control of a baffled plate

2000 : Région Wallonne - SAAB Active noise control of windows.



Related Publications ↑

■ P. DE MAN, "Contrôle actif du rayonnement acoustique des plaques : une approche à faible autorité", PhD Thesis, Université Libre de Bruxelles, juin 2004. ([pdf](#))

■ A. PREUMONT, A.FRANCOIS & S.DUBRU, Piezoelectric array sensing for real-time, broad-band sound radiation measurement, ASME Journal of Vibration and Acoustics, Vol.121, pp.446-452, October 1999.

■ A. PREUMONT & A. FRANCOIS, Piezoelectric Array Sensing for Real-Time, Broad-Band Sound Radiation Measurement, Proceedings of the 10th International Conference on Adaptive Structures and Technologies, pp. 37-44, 10-13 oct 1999, Paris.

■ P.DE MAN, A.FRANCOIS & A.PREUMONT, A Physically Based Strategy for Robust Feedback Control of Noise Radiation from a Baffle Plate, Internoise 2000, Nice

■ A.FRANCOIS, P.DE MAN & A.PREUMONT, Structural Sound Radiation Sensor Using a Piezoelectric Array, Materialsweek, September 2000, München. ([pdf](#))

■ P.DE MAN, A.FRANCOIS & A.PREUMONT, Robust Feedback Control of a Baffled Plate Through Vibroacoustic Optimization, 42nd AIAA Structural Dynamics conference in Seattle, 16-19 April 2001. ([pdf](#))

■ A.FRANCOIS, P.DE MAN & A.PREUMONT, Piezoelectric array sensing of volume displacement: A hardware demonstration. Journal of Sound and Vibration, Vol.244, No 3, pp. 395-415, 2001.

■ P.DE MAN, A.FRANCOIS & A.PREUMONT, Robust Feedback Control of a Baffled Plate via Open-Loop Optimization, Journal of Vibration and Acoustics. Vol. 124, No 1, pp.154-157, 2002.

■ A. Preumont, A. François, P. De Man & N. Loix, A Novel Electrode Concept for Spatial Filtering with Piezoelectric Films, 3rd World Conference on Structural Control, April 7-12, 2002, Como, Italy.

■ A. François, P. De Man, V. Piefort & A. Preumont, Spatial Filtering with Piezo Film Sensors, ISMA 2002, September 16-18, 2002, Leuven, Belgium.

- A. Preumont, A. François, P. De Man, Spatial Filtering with Piezoelectric Films via Porous Electrode Design, 13th International Conference on Adaptive Structures and Technologies, October 7-9, 2002, Berlin, Germany. ([pdf](#))

- A. Preumont, A. François, P. De Man & N. Loix, A Novel Electrode Concept for Spatial Filtering with Piezoelectric Films : Experimental Validation, Photonics Fabrication Europe SPIE Conference, 28 October - 1 November 2002, Brugge, Belgium.

- A. PREUMONT, P. DE MAN & A. FRANCOIS, Some issues related to the feedback control of a baffled plate, Journal of Structural Control, Vol.9, No 2, pp 153-167, 2002.

- P. De Man, A. François & A. Preumont, Active control of noise transmission through double wall structures: an overview of possible approaches, 6th National Congress on Theoretical and Applied Mechanics, May 26-27, 2003, Ghent, Belgium. ([pdf](#))

- A. François, P. De Man & A. Preumont, A novel electrode design for piezoelectric film sensors: experimental validation, 6th National Congress on Theoretical and Applied Mechanics, May 26-27, 2003, Ghent, Belgium. ([pdf](#))

- A. Preumont, A. François, P. De Man & N. Loix, Spatial Filtering for active vibration control of plates and shells, 5th European Conference on Noise Control, 19-21 May 2003, Naples, Italy.

- A. Preumont, A. François, P. De Man and N. Loix, A Novel Electrode Concept for Spatial Filtering with Piezoelectric Films, Active 2002, July 15-17, ISVR, Southampton, UK.

- A.PREUMONT, A.FRANCOIS, P.DE MAN & V.PIEFORT, Spatial filters in structural control, Journal of Sound and Vibration, Vol. 265, N°1, pp61-79, June 2003.

- A.PREUMONT, A.FRANCOIS, P.DE MAN, N.LOIX and K.HENRIOULLE, Distributed sensors with piezoelectric films in design of spatial filters for structural control, accepted for publication in the Journal of Sound and Vibration.