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Research Interests

- Modelling of sound propagation in ducts
- Modelling of sound attenuation in silencers containing “bulk reacting” porous materials.
- Prediction and measurement of silencer transmission/insertion loss.
- Design of splitter silencers used in HVAC ducts, and exhaust silencers used on I.C. engines
- Modelling of acoustically driven wall vibrations.
- Numerical (finite element based) and analytic methods.

Journal Publications

R. Kirby, “The influence of baffle fairings on the acoustic performance of rectangular splitter silencers,” *Journal of the Acoustical Society of America* **118** (2005) pp 2302-2312.

R Kirby and J.B. Lawrie, “A point collocation approach to modelling large dissipative silencers,” *Journal of Sound and Vibration* **286** (2005) pp 313-319.

R Kirby, “Transmission Loss Predictions for Dissipative Silencers of Arbitrary Cross-Section in the Presence of Mean Flow,” *Journal of the Acoustical Society of America* **114** (2003) pp 200-209.

R. Kirby, “Simplified techniques for predicting the transmission loss of a circular dissipative silencer,” *Journal of Sound and Vibration* **243** (2001) pp 403-426.

K.S. Peat and R. Kirby, “Acoustic wave motion along a narrow cylindrical duct in the presence of an axial mean flow and temperature gradient,” *Journal of the Acoustical Society of America* **107** (2000) pp. 1859-1867.

A. Cummings and R. Kirby, “Low frequency sound transmission in ducts with porous walls,” *Journal of Sound and Vibration* **226** (1999) pp. 237-251.

R. Kirby and A. Cummings, “Prediction of the bulk acoustic properties of fibrous materials at low frequencies,” *Applied Acoustics* **56** (1999) pp. 101-125.

R. Kirby and A. Cummings, “The Impedance of perforated plates subjected to grazing gas flow and backed by porous media,” *Journal of Sound and Vibration* **217** (1998) pp. 619-636.

J.B. Lawrie and R. Kirby, "Mode-matching without root-finding: application to a dissipative silencer," *Journal of the Acoustical Society of America* (in review).

Conference Publications

A Selamet, F.D Denia, F.J. Fuenmayor and R. Kirby, "Sound attenuation in partially-filled perforated dissipative mufflers with extended inlet/outlet," *Proceedings of the Twelfth International Congress on Sound and Vibration*, Lisbon, Portugal, July 2005.

JB Lawrie and R. Kirby, "On analysing the performance of a dissipative silencer: a mode matching approach," *Proceedings of the International Union of Theoretical and Applied Mathematics 2002/04*, Kluwer, Ed. A.B. Movchan, 2004.

R Kirby, "Modelling dissipative silencers using point collocation," *Proceedings of the Tenth International Congress on Sound and Vibration*, Stockholm, Sweden, July 2003, pp 3263-3270.

R. Kirby and J.B. Lawrie, "Modelling Dissipative Silencers in HVAC Ducts," *Proceedings of the Institute of Acoustics*, Salford, March 2002.

R. Kirby and A. Cummings, "The effects of flanking transmission on sound attenuation in a finite length lined duct, with mean flow," *Proceedings of Acoustical Society of America Conference*, Berlin, March 1999.

A. Cummings and R. Kirby, "Low frequency sound transmission in ducts with porous walls," *Proceedings of Inter-Noise 98*, Christchurch, New Zealand 1998.

R. Kirby and A. Cummings, "Structural/acoustic interaction in air-conditioning ducts in the presence of mean flow," *Proceedings of ISMA 23*, 1998, pp 677-684.

R. Kirby and A. Cummings, "Wall porosity effects on wave propagation in catalytic converter elements," *Proceedings of Inter-Noise 96*, pp 903-906.

R. Kirby and A. Cummings, "The acoustic impedance of perforated plates subjected to grazing flow and backed by a porous media," *Proceedings of Inter-Noise 96*, pp 967-970.

K. S. Peat and R. Kirby, "Temperature gradient effects upon the acoustic performance of catalytic converters," *Proceedings of Inter-Noise 96*, pp 1003-1006.

R. Kirby, K. L. Rathi, A. Cummings and K. S. Peat, "Analysis techniques for the acoustic analysis of dissipative silencers," *Proceedings of Euro-Noise 95*, pp 797-802.

R. Kirby and A. Cummings, "Bulk acoustic properties of rigid fibrous porous absorbents extended to low frequencies," Proceedings of Euro-Noise 95, pp 835-840.