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**The performance trade off of decentralised, distributed and  
centralised controllers**

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Direct velocity feedback control of structures is well known to increase structural damping and thus reduce vibration. In multichannel systems the way in which the velocity signals are used to inform the actuators ranges from decentralised controller through distributed or clustered controllers to the fully centralised controller. The objective of distributed controllers is to exploit the anticipated performance advantage of the centralised controller whilst maintaining the ease of implementation and robustness of the decentralised controller. It has been observed, however, that in many vibration control systems the centralised controller struggles to perform significantly better than a decentralised controller. This paper compares a number of distributed controllers and optimisation techniques for the reduction of kinetic energy and radiated sound power and identifies the conditions under which the centralised and distributed controllers offer a significant performance advantage.