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### **A new hybrid passive/active cell to realize a complex impedance boundary condition**

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Hybrid passive/active cells previously developed at the LMFA have proved their efficiency for global noise reduction. A hybrid cell combines passive absorbent properties of a porous layer and active control at its rear face. Active control is mainly used to increase absorption at low frequencies by cancelling the imaginary part of the surface impedance presented by the absorber. A specific decentralized control algorithm allowed realizing large panels to reduce multi-tone noise radiated by a flow duct. Generally, the design of such absorbers starts by determining the optimal impedance for the targeted application, defined as that which, for each frequency, produces the highest reduction. However, in many cases results show that this optimal impedance is complex and that both real and imaginary parts are frequency dependent. This paper investigates the potential of a new hybrid absorber intended to realize any of impedance. The new cell uses one microphone on each side of a resistive cloth. Normal velocity can then be deduced by a simple pressure difference, which allows an easy synthesis of the error signal. First experiments carried out in a standing wave tube are described and different control strategies are examined, allowing us to validate this promising concept.