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Enhancing bass absorbers using activated carbon

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Bass absorbers, either Helmholtz or membrane devices, are commonly used in small rooms to reduce the effects of standing wave modes. Previously, it has been shown that activated carbon can be used to change the compliance of loudspeaker enclosures. It has also been shown that activated carbon displays excess absorption at low frequencies. It has been suggested that the change in compliance and absorption is due to adsorption and desorption of air molecules on the surface of the carbon, caused by the compressions and rarefactions of sound waves. This paper investigates the extent of these effects to and their significance for resonant absorbers. The results show that activated carbon can lower the resonant frequency of a Helmholtz absorber, and also increases the quality factor of the resonance. The paper will discuss what the results mean in terms of the physical interaction between activated carbon and sound, as well as the practical application of the material to bass absorbers.