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Time-domain response measurement of the trumpet, and the room

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Abstract

The bell of a trumpet is a flaring horn which has two functions: on the one hand, it terminates the resonating bore and therefore controls the sound reflections traveling back to the mouthpiece. On the other hand, the bell controls the impedance match between the narrow downstream bore and the surrounding air in a room, and the radiation directivity. The cylindrical bore downstream of the mouthpiece can favor non- linear wave steepening: The “brassiness” of the sound perceived in the room depends on the amplitude of the pressure peaks inside the mouthpiece. To investigate these phenomena sound pressure measurements have been performed on a trumpet, with sensors inside the mouthpiece, and at different distances from the bell using “musical” excitation signals (generated by a trumpeter) and pulselike technical excitation signals, at various levels.

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