

NON-LINEAR SOUND PROPAGATION AND SPECTRAL ENRICHMENT AS A KEY TO CHARACTERISING BRASS INSTRUMENT TYPES

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ABSTRACT

Narrow-bore instruments are commonly perceived to be brighter than wide-bore models of the same kind of instrument. This effect is closely related to the effect of the bore profile of a brass instrument on the potential for non-linear propagation of sound within the tube. This paper reports on recent experimental work and numerical simulations aimed at deriving a quantitative prediction of the effect on timbre of nonlinear spectral enrichment in a brass instrument from measurements of its bore. An 'enrichment' parameter derived from bore shape and size is proposed which can be used to characterise types of brass instrument.