

SIMULTANEOUS AND IN VIVO MEASUREMENTS OF CONTROL PARAMETERS USED IN TRUMPET PERFORMANCE

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ABSTRACT

Brass instrument players combine several parameters to control the sound emitted by their instrument. According to the statements of musicians, different ways to play the same note seems to exist, depending on the player's proficiency, formation and musical background. We would like to bring out these difference in a more measurable way. In order to measure different control parameters used by the musician while playing, and monitor the reactions of the instruments, a set of sensors have been installed on a trumpet. Our experimental device allows in vivo simultaneous measurements of the mouth pressure (continuous and acoustic part), the pressure at the input of the instrument (mouthpiece), the phase of the motion of the musician's lips, the position of the trumpet valves, the force applied to the lips by the mouthpiece rim, the airflow through the instrument, and the radiated sound. Experiments are carried out with different musicians : simple musical tasks are performed and the sensors output are recorded. Different analysis highlight links between control parameters and oscillating variables. While some trends are shared by the different trumpet players recorded, quantitative analysis reveal different strategies according to the player. Repetability for each player is also investigated, and confirm some abilities of experienced players.