

EMERGENCE OF INHARMONIC COMPONENTS IN CLASSICAL GUITAR SOUNDS

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ABSTRACT

Inharmonic components due to body modes are present in the transient phase of classical guitar sounds. The aim of this paper is to investigate their emergence using high resolution analysis methods. Using a wire breaking technique, the near field radiated pressure is recorded in various plucking conditions on classical guitars. An analysis-synthesis approach making use of the ESPRIT method is presented and some indicators of body-sound emergence are proposed and calculated. The influence of the conditions of excitation on the body-sound emergence is first characterized. In a second step, the calculation of these indicators of emergence is performed over a large pool of instruments, including high-end hand-made guitars, as well as entry-range industrial instruments. The main result show an overall greater sensitivity of high end guitars to the excitation conditions with regards to the emergence of the body sound at tone onset, hence allowing an objective categorization of the instruments.