

PIEZOELECTRIC FILM SENSORS FACILITATE SIMULTANEOUS MEASUREMENT OF BOWING PARAMETERS AND BRIDGE VIBRATIONS DURING VIOLIN PLAYING

Gunnar Gidion, Reimund Gerhard

Applied Condensed-Matter Physics, Institute of Physics and Astronomy,

University of Potsdam, Germany

gidion@uni-potsdam.de

reimund.gerhard@uni-potsdam.de

ABSTRACT

In violin playing, an important part of the interaction between the player and the instrument is mediated by the bow. The bridge, on the other hand, transfers the bowed-string vibrations to the violin body. For the present investigations, both the action of the bow and the bridge are detected by thin polymer-film sensors with piezoelectric properties. By combining this technology with conventional acoustic and optical means of detection, aspects and measures of playability (especially the minimum bow force) can be referred to the respective bridge and body vibrations. Results are discussed in terms of the theoretical framework of Woodhouse and in comparison to the experimental work of Schoonderwaldt and Demoucron.