PROCEEDINGS of ISMA 2019
International Symposium on Music Acoustics

13 - 17 September 2019 in Detmold, Germany

Vibration characteristics of oud soundboard

Sinan INANLI[1]; Ercan ALTINSOY[2]

(1) TU Dresden, Germany, inanli@gmail.com
(2) TU Dresden, Germany, ercan.altinsoy@tu-dresden.de

Abstract

Oud is a plucked musical instrument played in many countries. It has a short neck, fretless keyboard and lute-like body. There are three sound holes on the soundboard arranged in triangular position. Its soundboard has a thickness varying between 1.5-2.0 mm and seven fan braces are placed on the inner side parallel to each other and perpendicular to the string alignment to withstand the force created by the string tension. Walnut, mahogany, maple, rosewood family and wenge are some of the most common hard woods used in the body of the instrument whereas spruce and cedar are the tone woods used to construct the soundboard. This historical musical instrument involves many structural parts effecting its acoustics and sound quality. This study aims at investigating the vibration characteristics of an oud soundboard for free-free and fixed (at its edges and no back cavity) boundary conditions. Also, as a final step, soundboard-air cavity coupled modes were measured by assembling the soundboard and body together. Frequency response function (FRF) measurements were carried out by experimental modal analysis technique to reveal the dynamic behavior (mode frequencies, mode shapes and damping coefficients) of the soundboard which has a conventional strutting configuration.

Keywords: Oud, Soundboard, Modal Test

[1] inanli@gmail.com
[2] ercan.altinsoy@tu-dresden.de