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## ”JJCAB5#6 - Geometrical, Flexural and Vibrational Characterization of Saxophone Reeds”

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The sound production by the saxophone, a single-reed wind instrument relies mainly on the control of the vibration of a plate by the player’s lower lip and the air blown into the instrument. This vibrating plate is securely attached to the mouthpiece and is known as a reed. It is one of the principal components responsible for generating notes played by musicians. Traditionally, saxophone reeds are made from natural cane, particularly *Arundo-Donax*. However, these reeds may have certain disadvantages such as limited durability and anisotropy bucur\_traditional\_2019. To address these inconsistencies, synthetic reeds have emerged as an alternative.

In this study, we have investigated eight different reeds, including both synthetic and natural ones and, compared their design, material and vibroacoustic properties. We employed microtomography to capture the 3D view of each reed and redesigned it using CAD software. A bending test was conducted to test the property of the reed material. Finally, vibroacoustic tests were performed to effectively analyze the dynamic properties of the reeds, and modal analyses were carried out to identify the vibrational modes and their corresponding damping factors. Ultimately, these reeds were compared based on their respective design, rigidity, and vibroacoustic properties. The long-term aim of this study is to facilitate the fabrication of reeds aiming to aide musicians in customizing their reeds that can align with their specific needs.

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