Rolf Bader: Computational mechanics of the classical guitar

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As shown by the proliferation of scientific literature on the subject, in the field of applied acoustics the mathematical modelling of musical instruments has recently aroused the interest of numerous researchers. The book in question is part of this type of research work and gives an accurate, detailed analysis of the structural components of a classical guitar, proposing mathematical models featuring various levels of complexity. By assembling the latter, as one would the respective real components, the author manages to make a virtual guitar. By analysing the sound emitted, it is possible to evaluate the effects of a considerable number of construction parameters: materials used, geometry of the instrument and of the bracing, thicknesses of the sound board and many others besides. Among

the various reasons of interest in this work, worth particular note is the fact that the model in question keeps due account of the percussive nature of the instrument, even going as far as to reproduce its transient behaviour. A propos of this, in order to directly solve the equations with partial derivatives that describe the dynamic response of the instrument, the Author opts for use of the finite differences method.

Although this virtual guitar might give the impression of only being able to be used by experts in the field, even luthiers, with the aid of skilled input, might find this book interesting with a view to obtaining useful suggestions that could help them improve prototype development.

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