

## **PRE-ASSEMBLY VIOLIN AURALIZATION—LISTENING TO PLATE-TUNING TRENDS AND TO FINE MODEL-ADJUSTMENTS**

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### **ABSTRACT**

Listening to violins before or during the manufacture process might be desirable for luthiers. Two different approaches are revisited and compared. One approach identifies the mutual dependencies between plate modes, body modes and cavity modes as empirically derived from pre-assembly and post-assembly measurements [Bissinger, J. Acoust. Soc. Am. 132, 465 (2012)]. The derived model uses the critical frequency as an intermediary key parameter to co-define body and cavity modes as well as the radiation efficiency at higher frequencies. The bridge rocking frequency serves as a secondary key parameter to define radiation in the frequency range above 2 kHz. While varying these parameters the resulting radiation filter allows to listen to trends that directly translate to mode 2 and mode 5 plate tuning but also to bridge tuning [Bissinger and Mores, J. Acoust. Soc. Am. 137, EL293 (2015)]. The other approach is based on sampling technology. The binaural impulse responses of an existing reference violin is sampled in the preferred listening position in a luthier's shop. Based on this sample, a luthier can modify individual resonances while editing in the frequency domain in order to explore fine adjustments for future models. A method has been developed to preserve the sampling quality while transforming such a partially modified violin spectrum into an audio-processable filter [Türkheim et al., DAFx-10 1-6 (2010)]. By means of real-time processing, a luthier can listen to the virtually modified violin while playing a silent violin. Both systems will be examinable during the poster session.