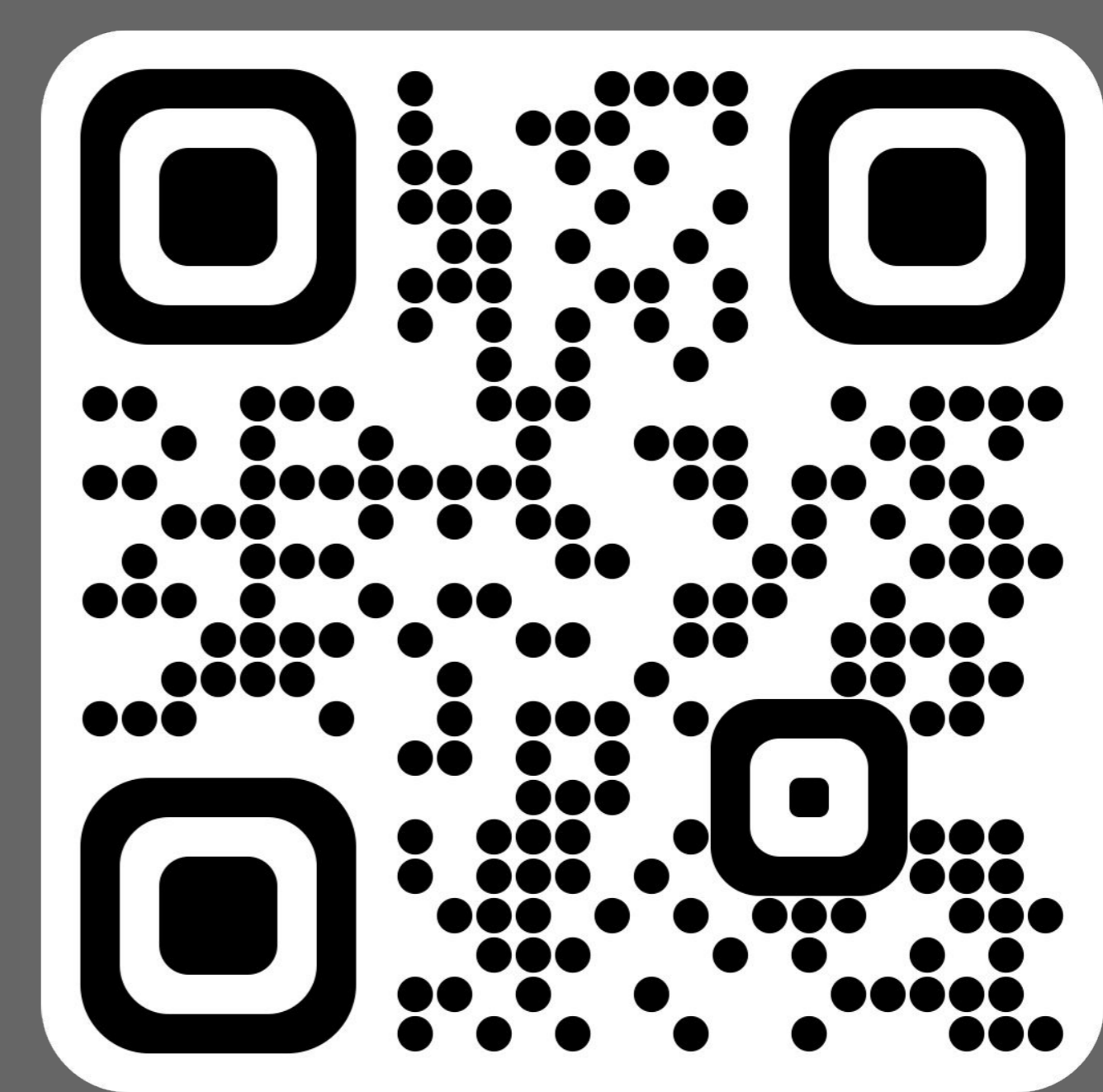


Why does the pitch bend sound different in a virtual sitar?



Differentiating the Pitch Bend Between a Live and Virtual Sitar

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The Pitch Bend and the *meend* in Sitar Performance

The pitch bend is a tool used in software based music composition to smoothly slide between two notes. While it works well with some instruments, it does not capture all the intricacies of the movement, notably in stringed instruments that contain sympathetic strings.

The sitar is one such stringed instrument, where the twelve differently tuned sympathetic strings vibrate in accordance to the note being played on the main, plucked string. The *meend* technique in sitar performance involves pulling the first main string downwards while staying on a fret to smoothly increase the pitch of the note being heard.

Methodology

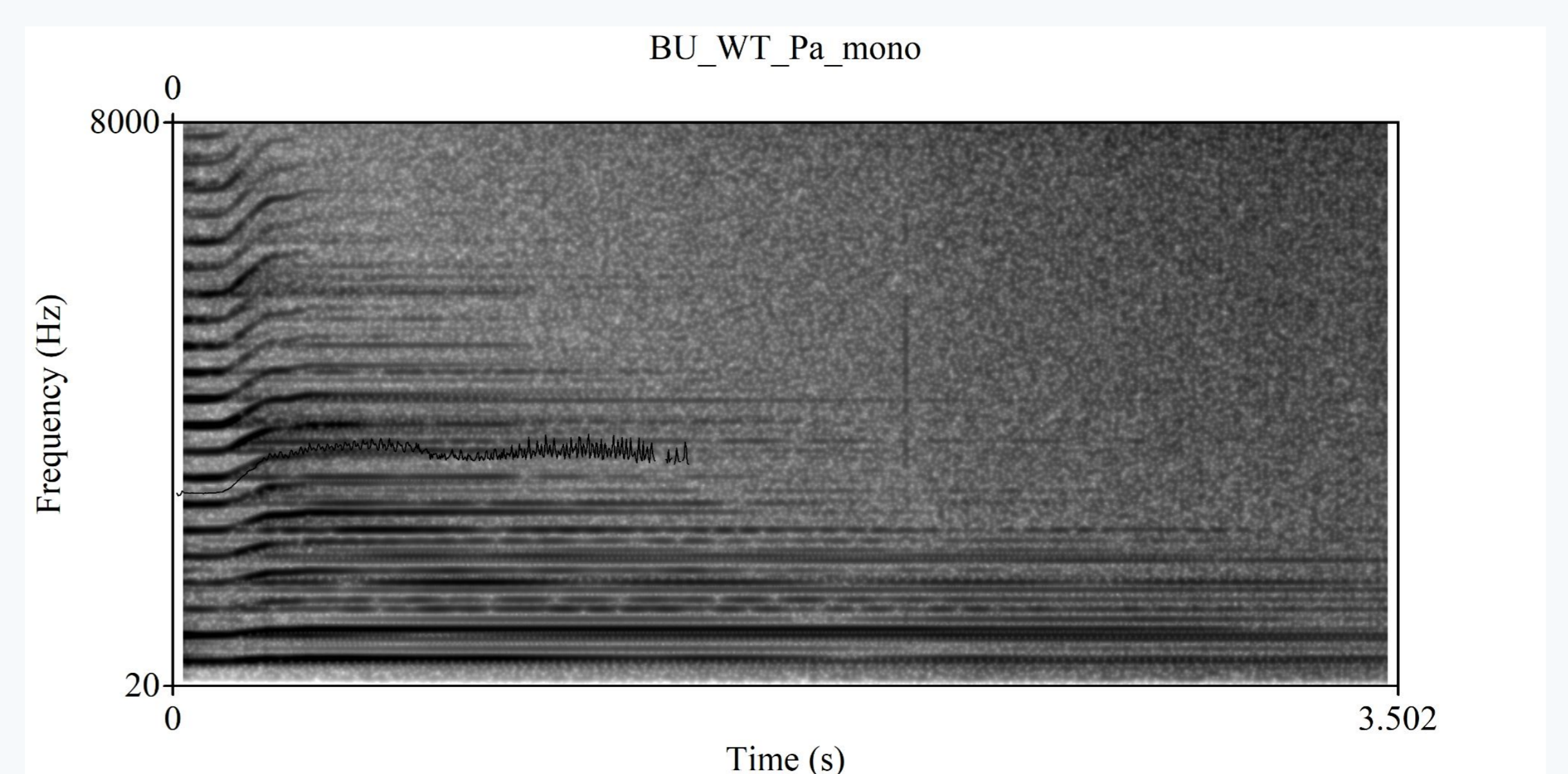
Samples of meends were taken from a sitar that was recorded live, and also from recordings of the same pitch movement of similar duration pitch bends being played on a virtual sitar on Logic Pro X. Each sample constituted one pitch bend from one specific note to another.

The samples were then imported into the PRAAT software, where their corresponding time-frequency pattern spectrograms were compared in order to identify differences between the two.

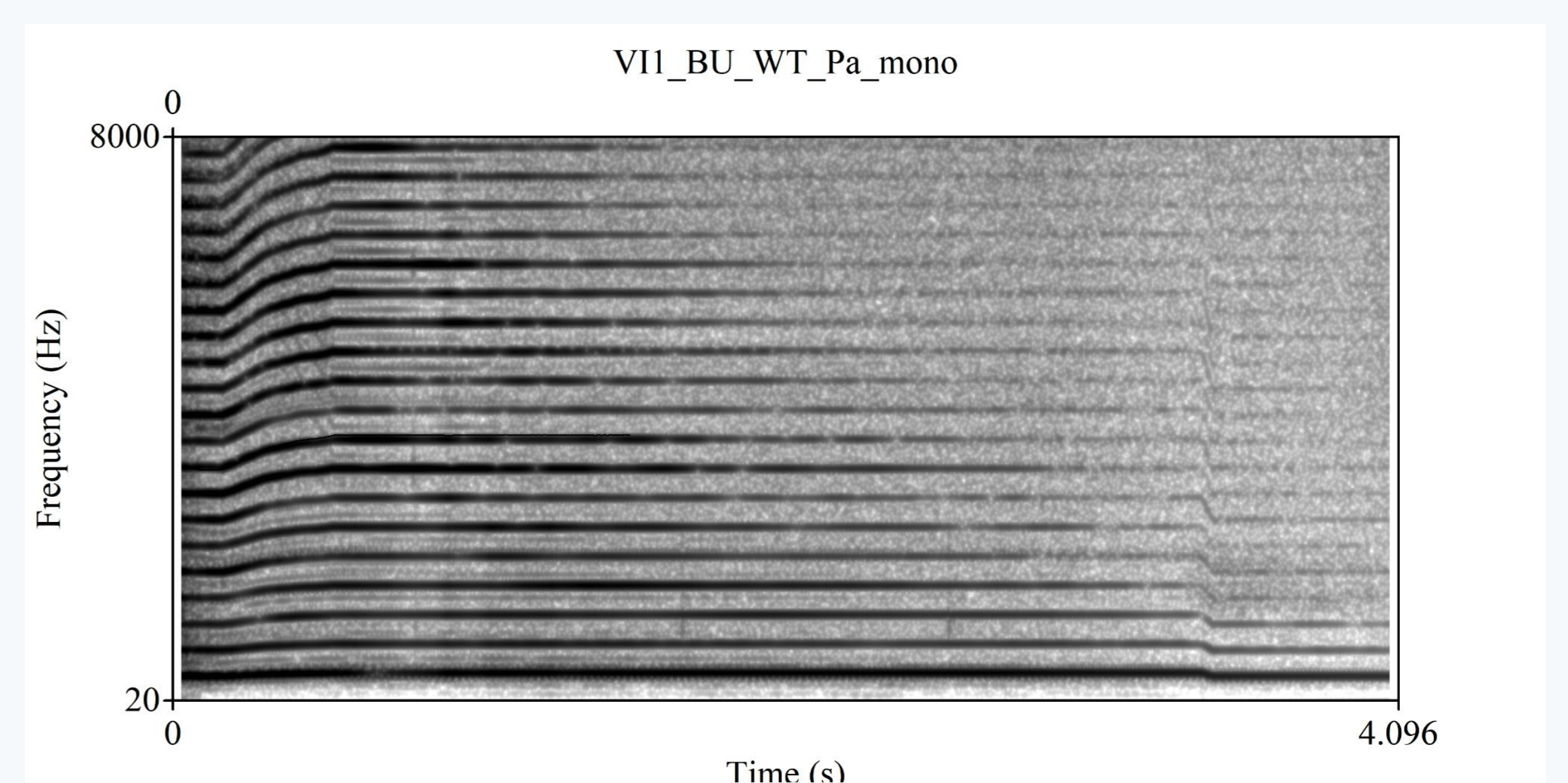
Analysis and moving forward

The continued presence of the residual sympathetic string vibration in the live-recorded sitar as a response to the excitation of the starting note of the meend is visible in the spectrogram and can clearly be made out on listening to the sample as well. This is in contrast to the virtual sitar's pitch bend, where the residual sympathetic string vibration of the starting note is neither visible nor audible after the pitch has moved to the final note of the bend.

Could the virtual sitar instrument be treated as a multi-sampled instrument, in order to treat the sympathetic string and main string information separately? How then, does one obtain a sample of only the sympathetic strings?



Bend up from *Ma* (major fourth) to *Pa* (perfect fifth) on a live-recorded sitar



Bend up from *Ma* (major fourth) to *Pa* (perfect fifth) on a virtual sitar