

Figure 11: Averages of the spectra from the instruments with the 5 highest versus the 5 lowest DE-F sum values.

### 3.7 High versus low overall SPL

Figure 12 shows the average curve for the 5 instruments with the highest and lowest overall sound pressure level SPL. In timbre experiments variations in SPL is often compensated for, as it is known to be a dominating factor. However, instruments do tend to be more or less loud as a natural property.

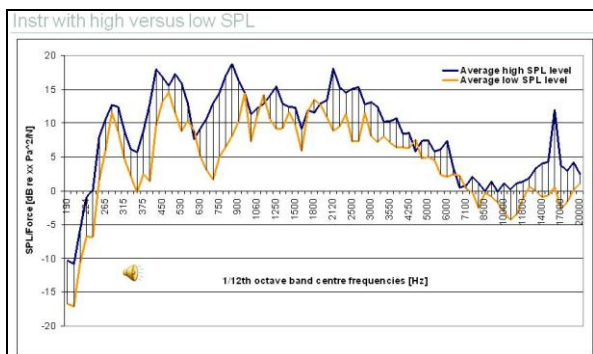


Figure 12: Averages of the spectra from the instruments with the 5 highest versus the 5 lowest overall SPL values.

There are differences of about 0-8dB or so between the spectra, and the louder instruments tend to be stronger almost all the way. A trained eye will see that the stronger instruments probably are the better ones. The mid frequency range is moderate. (The peak seen at 16 kHz is from my tube TV). The difference in the sound samples is heard as a louder sound plus possibly a more ‘punchy’ and piercing character.

### 3.8 A possible new combined timbre parameter

In earlier studies of recordings of fine old violins I have used a combined parameter combining Dünwald’s parameters and the SPL:  $L + ACD-B + DE-F + SPL$ , [6].

Figure 13 shows the average curve for the 5 instruments with the highest and lowest overall summed Dünwald parameter values and SPL. The differences are a bit more moderate than those shown in Figure 12 for the SPL, some 0-6 dB. In general the bands assumed to be beneficial are stronger for the blue curve. The assumed negative B and F regions are weaker.

The sound samples are less different than the DE-F and A0 examples, but are still quite pronounced. In general the higher values example is the better sounding.

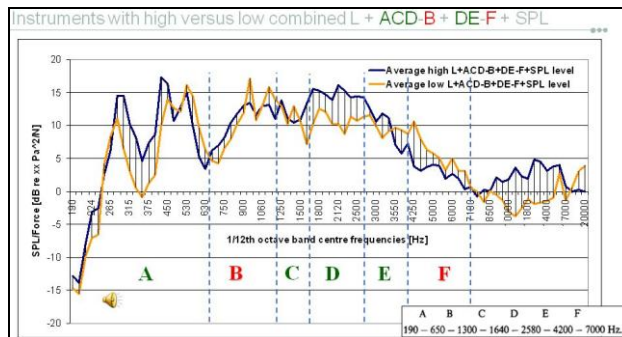


Figure 13: Averages of the spectra from the instruments with the 5 highest versus the 5 lowest combined Dünwald parameter values + SPL.

## 4. CONCLUSIONS

Old Italian violin tone has been assessed through Dünwald’s parameters extracted from spectra from 36 violins and Hardanger fiddles over time accessible to the author. Preliminary results indicate that:

- Stronger A0 levels seem to be a more robust than just stronger L parameter values in the data set
- Lighter tops and less stiff central part of the top plates may lead to instruments with higher L and A0 levels.
- The differences in the ACD-B parameter seems to be less dominating than the DE-F in the sound samples
- Differences in the overall SPL, and the combined parameter, seem to be clearly audible. Instruments with higher values seem to sound more ‘punchy’, and simply better.
- 7 golden age Strads, a Vuillaume and violins made by 5 contemporary US and German makers (6 instruments) all met the  $L \geq 18$  dB criterion.

## 5. REFERENCES

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