

## **Measurement and sound quality issues concerning low-frequency noise**

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### **Abstract**

The subjective significance of low-frequency noise, especially at low objective levels, challenges measurement. Near-threshold yet clearly audible annoying low-frequency hearing events are affected by a number of factors. Density level, modulations, discrete beating tones even at near-infrasonic frequencies, or other time-varying effects, can cause low-frequency noise to be perceived whereas it might otherwise pass unnoticed; an issue for example in low-noise HVAC design such as for concert halls. In addition to relating measurement to sensation to resolve relevant factors affecting noticeability and annoyance, measurement must consider that low-frequency energy can raise A-weighted overall level if the beginning and end of a time-data sequence to be analyzed exhibit a large difference in level due to low or even infrasonic energy otherwise of less subjective concern. Examples will illustrate various measurement issues, techniques and potential errors, particularly for matching human sensation.