

ACOUSTICS2008/1971
**Sources and potential influences of uncertainty in ground
impedance measurements and estimations**

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Knowledge of acoustic impedance of ground surface is essential for determining noise levels outdoors. At distances up to a few hundred metres from the source ground effect may be the dominant factor. The short-range measurement of sound level spectra from an omni-directional source has been used as a standard method to deduce the acoustic impedance spectrum of ground surfaces (e.g. ANSI S1.18, 1999). However, there remain a number of uncertainties in such measurement methods. For example, at low frequencies the difficulties in fitting theoretical or phenomenological models to short range data may result in a large uncertainty in predictions of sound levels at larger distances. Another source of uncertainty is the variability of the acoustic impedance of apparently uniform ground. Another potential influence on predictions of long term equivalent noise levels is seasonal variation. This paper discusses the extent and potential influences of such uncertainties in measured and deduced ground impedance spectra.