

Gaussian chirplets in time-frequency analysis of sounds

Ville Turunen

Helsinki University of Technology, Finland

A Gaussian chirplet is a function $g : \mathbb{R}^n \rightarrow \mathbb{C}$ defined by

$$g(x) = \exp(ax^2 + bx + c),$$

where $a \in \mathbb{C}$ has negative real part. Such functions are well-localized in both *time* $x \in \mathbb{R}^n$ and *frequency*, which is ideal in signal processing applications. Of special interest is dimension $n = 1$, for analyzing sound signals. We will make observations on the underlying symmetries, signal measurement, filtering, and computation of time-frequency representations.