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Application of wavelet- and wavelet-packet-transform to human skin data

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Résumé / Abstract

Until a few years ago measurement of human skin and analysis of its data was limited to profiles of surface imprints. New measurement devices, based on image processing, allow measurement of whole areas of skin on the living person, i.e. in vivo, today. Therefore a change in analyzing human skin topography takes place why preprocessing of raw measurement data is extended to two dimensions. To characterize the skin and its reaction on external influences, innovator techniques can be used like the regularization dimension, a parameter similar to the fractal dimension. Also new transforms like the wavelet- or wavelet-packet-transform can be used, which divide the signal into different frequency parts, while spatial resolution and directional information of it is preserved. This paper deals after a short introduction with a comparison of classical filtering methods and the wavelet-transform as a new preprocessing algorithm in the second part. After this a characterization of external influences on human skin is done with classical parameters. The wavelet-packet-transform as a new tool is used to analyze the data and the reaction of skin in different frequency bands, to investigate the effects more detailed and to show some advantages of this transform in the third paragraph. A short conclusion sums up the results.

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