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# A new method for investigating heterogeneities from well logs using the Hilbert-Huang transform

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Borehole logs exhibit multi-scale properties that cannot be analyzed using the conventional tools. Here, we propose a new method based on Hilbert-Huang transform (HHT), a combination of the empirical mode decomposition (EMD) and Hilbert transform (HT), for estimating a local scaling coefficient from well logs. This parameter measures heterogeneities degree of the layers crossed by the borehole.

The proposed technique has been applied on P- and S-wave seismic velocity logs recorded at the KTB main borehole drilled for the German Continental Deep Drilling program. The calculated depth-dependent scaling parameter highlighted the lithological discontinuities occurred within the logged depth interval, and allowed to measure the complexity of underground heterogeneities.
To conclude, the suggested method presents a new way to explore multi-scale features of the logs data, and may bring additional information to the conventional analysis tools. More datasets are needed to establish a possible relationship between the local scaling parameter and lithology.