Minisimposia: Tensor approximation methods for multidimensional problems: theory and applications.

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The most *difficult problems* of numerical computations nowadays are those *of higher dimensions*, for instance, modelling of multi-particle interactions in large molecular systems such as proteins, biomolecules, and nanostructures, problems of material sciences, and financial mathematics as well as those arising in stochastic PDEs. All these computational problems require, in particular, approximation of integral/differential operators on "physical domain" $[0,1]^d \subset \mathbb{R}^d$ with $d \geq 3$. Traditional applications which include multidimensional data are regarded to chemometrics, signal processing and stochastic models.
Many of standard methods have computational complexity that grows exponentially in the physical dimension d, hence, they become useless because of *"the curse of dimensionality"*. Methods which allow to remove the dimensionality parameter d from the exponential are distinctively linked with the idea of tensor-product constructions on all stages of the solution process. Recent efficient methods, like hierarchical matrices with low-rank blocks and hyperbolic cross approximations, rely on a certain separation of variables. The strategy of separation of variables is directly pursued in modern *tensor approximation paradigm.*
In this minisimposia we are going to discuss advanced tensor approximation methods and their applications in scientific computing, signal processing and stochastic models.