The breaking through approach to low-parametric representation of multivariate functions and operators is based on the principle of separation of variables which can be realized by using approximation in rank-structured tensor formats [1]. This allows the linear complexity scaling in dimension, hence breaking the "curse of dimensionality". The method of quantized tensor train approximation (QTT) is proven to provide the logarithmic data-compression on a wide class of discretized functions and operators [2].

We discuss how the tensor methods based on the TT and QTT approximations apply to parabolic equations in space-time formulation with the particular examples of the multi-dimensional Fokker-Planck [3] and the chemical master equations [4].

The efficiency of the tensor approach is illustrated by numerical examples.


