

# Scales invariant linear interpolation and singular perturbed vector fields

Viatcheslav Bykov

Karlsruhe University, Karlsruhe, 76131, Germany, [bykov@itt.uka.de](mailto:bykov@itt.uka.de)

The problem of modelling, simulation and results' analysis of complex systems arising in reacting flows requires more and more sophisticated methods of qualitative system analysis. Recently, the concept of invariant, slow/fast -, attractive and stable manifolds has proven to be an efficient tool of such an analysis. In particular, it allows studying properties of detailed system describing the reacting flow by considering appropriate low dimensional manifolds, which naturally appear in the system state/composition space as a manifestation of a restricted number of degrees of freedom exhibiting by the system. In order to answer the question what is a minimal number of degrees of freedom (system dimension) and to find/approximate suitable low dimensional manifolds (reduced system's spaces) the concept of Singular Perturbed Vector Fields (SPVF) has been suggested lately. In the talk a scales invariant version of the application of (SPVF) to some model examples will be presented and discussed.