



Proper Generalized Decomposition of geometrical parametrization of boundaries and internal interfaces: multidimensional parametric problems for inverse problems and uncertainty quantification

Inverse problems to identify the geometry of internal interfaces are very common in geophysics but also in many other disciplines. For instance, aiming at identifying geological structures from surface thermal measurements. Facing this problem requires having the possibility of testing a very large number of geometric configurations combined with a variety of different material parameters (thermal diffusivity). The number of problems explodes with number of free parameters, suggesting the use of reduced order models. We explore the use of PGD in this context, introducing the separable approximations in both the geometric and the material parameters. The PGD approach results extremely efficient in this context, producing a computational vademecum that transforms the inverse problem into a simple functional exploration.

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