

**Intrinsic Proper Generalized Decomposition modes of parametric symmetric elliptic problems on Grassmann manifolds.****Authors:**

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**Abstract:**

In this work, we introduce an iterative optimization algorithm to obtain the intrinsic Proper Generalized Decomposition modes of elliptic partial differential equations. The main idea behind this procedure is to adapt the general Gradient Descent algorithm to the algebraic version of the intrinsic Proper Generalized Decomposition framework, and then to couple a one-dimensional case of the algorithm with a deflation algorithm in order to keep enriching the solution by computing further intrinsic Proper Generalized Decomposition modes. For this novel iterative optimization procedure, we present some numerical tests based on physical parametric problems, in which we obtain very promising results in comparison with the ones already presented in the literature. This support the use of this procedure in order to obtain the intrinsic PGD modes of parametric symmetric problems.

**References:**

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