

Mimetic Discretization Methods

Mimetic discretizations or compatible discretizations have been a recurrent search in the history of numerical methods for solving partial differential equations with variable degree of success. There are many researches currently active in this area pursuing different approaches to achieve this goal and many algorithms have been developed along these lines.

Loosely speaking, "mimetic" or "compatible" algebraic methods have discrete structures that mimic vector calculus identities and theorems. Specific approaches to discretization have achieved this compatibility following different paths, and with diverse degree of generality in relation to the problems solved and the order of accuracy obtainable.

Here, we present theoretical aspects a mimetic method based on the extended Gauss Divergence Theorem as well as examples using this methods to solve partial differential equations using the Mimetic Library Toolkit (MTK).