Significance & Novelty

April 7, 2019

A new framework for simulating problems involving interfaces between all three major phases of matter (and vacuum regions) is presented. The same set of equations is used throughout the domain. Regardless of the kind of materials meeting at an interface, the interface states are calculating using the same methodology. This methodology is derived from a new eigenstructure analysis of the equations of the GPR model, also presented here.

The framework is demonstrated to be effective on a range of 1D and 2D multimaterial tests. This has the potential to streamline development of simulation software, by reducing the number of different systems of equations that require solvers, and cutting down on the amount of theoretical work required to deal with the interfaces between materials.