

Asymptotic Behavior of systems of PDE arising in physics and biology: theoretical and numerical points of view (ABPDE III)

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Maxwell's equations with sign changing permittivity tensor

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To model hybrid resonances in fusion plasma, Maxwell's equations feature a sign changing permittivity tensor. The problem can be expressed as a degenerate elliptic PDE. There is no uniqueness of the solution, and the solutions admit a singularity inside the domain.

A small regularizing viscosity parameter can be introduced, but the problem is still numerically challenging because of the competition of this small parameter with the discretization step.

The work presented will consist of the characterization of the limit solution in a mixed variational setting and will be numerically illustrated.

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