

On Space-Time Variational Formulations for Maxwell's Equations

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Maxwell's equations are the key to electro magnetic problems. There are many approaches to solve these equations and most try to eliminate the time derivative to simplify the equations. In contrast to these methods we consider time as another dimension and look at Maxwell's equations in a corresponding 4D space-time setting. For that purpose we look at the equations on a bounded Lipschitz domain in space and a bounded interval in time. The electric permittivity and magnetic permeability shall be symmetric, positive definite and bounded matrix functions. We will consider different variational formulations and try to determine under what conditions Maxwell's equations are uniquely solvable.

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