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Eprints ID: 4122

**To cite this document:** CLAEYS Xavier, COLLINO Francis. Derivation, justification and analysis of the Holland method for a model wave propagation problem. In: *GAMM 2010*, 22-26 March 2010, Karlsruhe, Germany.

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# Derivation, Justification and Analysis of the Holland Method for a Model Wave Propagation Problem

**Xavier Claeys, ISAE Toulouse**  
**Francis Collino, CERFACS Toulouse**

The Holland method is a modification of a classical Yee scheme introduced to deal with thin conducting wires when solving Maxwell's equations. This method can be very accurate, but it requires a careful calibration.

There still does not exist any systematic recipe for this calibration but, in a previous work we have introduced an augmented Galerkin scheme adapted to the simulation of wave propagation in 2-D domains with small holes and we have shown that, for canonical situations, this numerical scheme could actually provide an automatic process for the calibration of the Holland method.

In this talk we would like to describe precisely how, under symmetry assumptions, the traditional Holland scheme used for solving 3-D Maxwell's equations around thin wires actually reduces to this 2-D model situation. We will also present new theoretical results of numerical analysis on this subject.