

# Some features of a generalized plane wave method

Lise-Marie Imbert-Gérard

Université Pierre et Marie Curie

## **Abstract**

This talk focuses on a generalized plane wave method adapted to some plasma fusion application, for instance the probing technique called reflectometry. This method has been developed to compute the solution of the Helmholtz equation when the coefficient vanishes smoothly at some point.

The method is based on the UltraWeak Variational Formulation (UWVF) together with the use of new basis functions. The basis functions are exponential of polynomials, and the coefficients of the polynomials are chosen to ensure the function in an approximated solution to the homogeneous equations.

A convergence result will be explained in a first part, with the main steps of the proof. Then as examples the design of basis functions will be detailed for two different equations. At last some numerical features of the method will be highlighted through the presentation of numerical examples.