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Numerical Analysis of 3D Electromagnetic Fields in Annular Induction Plasma

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Abstract : The mathematical models of the physical phenomena interacting in inductive plasma were described by the physics equations of the continuous mediums. A 3D model based on magnetic potential vector and electric scalar potential (A, V) formulation is used. The finished volume method is applied to electromagnetic equation, to obtain the field distribution inside the plasma. The numerical results of the method developed on a basic model designed starting from a real three-dimensional model were exposed. From the mathematical model 3D spreading assumptions and boundary conditions, we evaluated the electric field in the load and we have developed a numerical code made under the MATLAB environment, all verifying the effectiveness and validity of this code.

Keywords : electric field, 3D magnetic potential vector and electric scalar potential (A, V) formulation, finished volumes, annular plasma
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