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Section D: Development of Biotechnological Process

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Develop of 3D Pixeled Phantom Brain to Simulate There Interaction with Electromagnetic Fields

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Abstract: Matter-radiation appears in situations like: medical radiology or electric high tension systems. Make a prediction about the effects of radiation over the organic tissue require the Maxwell's equations solution. Many investigators works in numerical solutions in 2D with organic pixeled phantoms, but there are designed with simple geometrical structures, and when somebody proposed a 3D model, just take a 2D slice, because they spend less memory.Our objective is solve the Maxwell's equation using Finite Element, to obtain the electric and magnetic fields, over a realistic pixeled phantom human's brain, this model was developed for us, and after we calculate the induced current density produced on the brain.To design a pixeled anatomical phantom from Magnetic Resonance Imaging, we take a stack of image slices from organ, and using a computational packet we obtain a rendering 3D image. This anatomical model, have electric and magnetic properties in function of frequency.The 3D pixeled imaging generated was used to apply this methodology to a subway or any electric transport with catenary line, there transport 600A of electrical current with 750V of electric tension. We propose a distance between catenary and driver just of 50cm.

Keywords: Pixeled Phantom, Matter-Radiation Interaction, Electromagnetic Field Effect

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