Thermoelastic Model for Microwave Ablation of Concrete

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Abstract

The use of high power microwave energy for ablation of contaminated concrete is a promising technique to speed up the dismantling of nuclear power plants. A coupled simulation using COMSOL Multiphysics® finite element software is performed by solving the electromagnetic wave equation at 2.45 GHz for a standard wave guide and a concrete block. The temperature field is obtained with the heat equation and the microwave power dissipation as a source term. The displacements and stress fields are obtained by solving a thermo elastic model.

keywords: microwave heating, thermo elasticity, concrete

Reference

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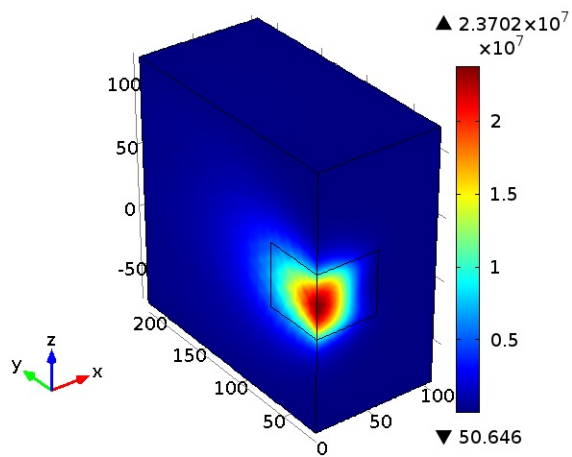
Figures used in the abstract
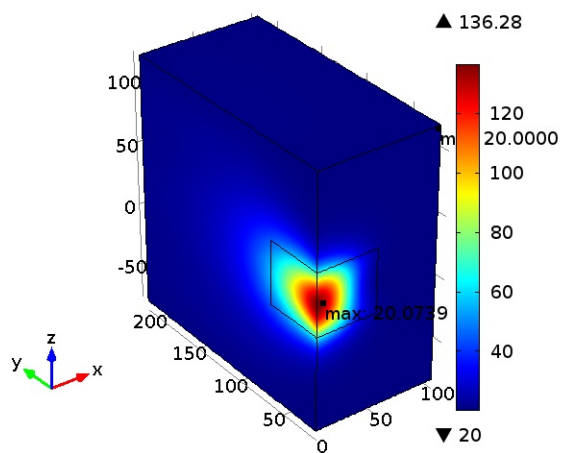

Figure 1: Power density
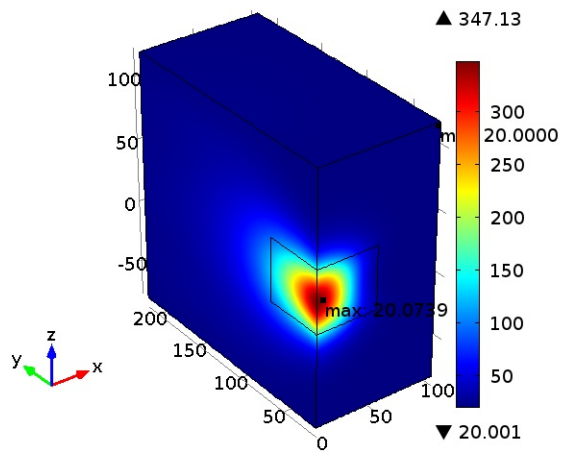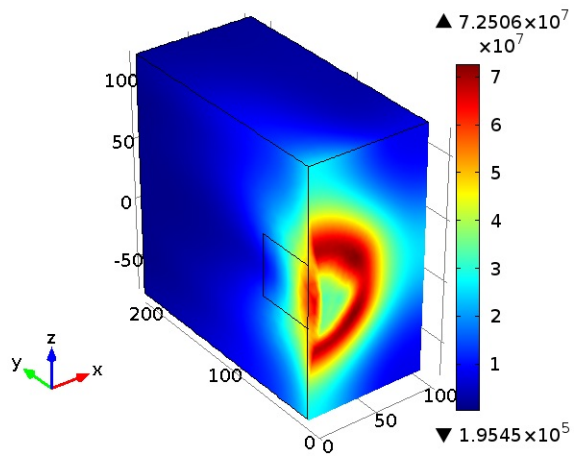

Figure 2: Temperature after 10 s

Figure 3: Temperature after 30 s

Figure 4: Von mises stress after 30 s