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**Microwave heating of laminate panels. (English summary)**

Applied-mathematical perspectives on microwave processing.

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The use of microwaves to heat laminate panels occurs in a variety of industrial processes from chemical vapor infiltration (CVI) systems to the curing of adhesives in laminate panels. The electrical conductivity of the materials used in these systems is typically temperature-dependent. Characteristically, the thickness of the laminate panel is on the order of the wavelength of the incident microwave, but the thickness of the laminate sheet is much smaller. This allows one to apply asymptotic techniques to find averaged wave and heat equations when the direction of the incident microwave is normal to or tangent to the laminates. These equations are analyzed in the small-Biot-number limit and are numerically approximated using finite differences. The results are in excellent agreement for small Biot numbers. More importantly, heating trends are observed for a wide variety of volume fractions for two particular CVI applications. In addition, the effects of the incident polarization on the heating process are also established.

In particular the use of a TE polarized incident microwave is shown to be inefficient in certain CVI applications, but produces a more favorable temperature gradient.

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