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The role of malignant tissue on the thermal distribution of cancerous breast

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## Highlights

- Analytical and numerical tools are used to investigate the thermal distribution of cancerous breasts.
- The cross-section of the cancerous breast is identified by a homogeneous glandular tissue that surrounds the heterogeneous tumor tissue, which is assumed to be a two-phase periodic composite.
- Asymptotic periodic homogenization method is exploited to study effective properties in the heterogeneous region.
- Semi-analytical results show that the tumor volume fraction in the heterogeneous zone influences the breast surface temperature, in agreement with the experimental literature.
- The tissue scale temperature profile qualitatively agrees with experimental observations in region where cancerous heterogeneities are present.

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