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Homogenization of the Parabolic Signorini Boundary-problem in a Thick Plane Junction

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We consider a parabolic Signorini boundary-value problem in a thick plane junction Ω_ε which is the union of a domain Ω_0 and a large number of ε -periodically situated thin rods.

The asymptotic analysis of the problem is made as $\varepsilon \rightarrow 0$, i.e., when the number of the thin rods infinitely increases and their thickness tends to zero. With the help of the integral identity method we prove the convergence theorem and show that the nonuniform Signorini conditions are transformed (as $\varepsilon \rightarrow 0$) in the limiting variational inequalities in the region that is filled up by the thin rods in the limit passage.

The results above stated are obtained with professor T. A. Mel'nyk.