

1123-35-414

Agnid Banerjee, Mariana Smit Vega Garcia and Andrew K Zeller*

(zellera@purdue.edu). *Higher regularity of the free boundary in the parabolic Signorini problem.*

We show that the quotient of two caloric functions which vanish on a portion of an $H^{k+\alpha}$ regular slit is $H^{k+\alpha}$ at the slit, for $k \geq 2$. In the case $k = 1$, we show that the quotient is in $H^{1+\alpha}$ if the slit is assumed to be space-time $C^{1,\alpha}$ regular. This can be thought of as a parabolic analogue of a recent important result of De Silva and Savin, whose ideas inspired us. As an application, we show that the free boundary near a regular point of the parabolic thin obstacle problem studied in a recent paper of Danielli, Garofalo, Petrosyan, and To with zero obstacle is C^∞ regular in space and time. (Received August 30, 2016)