Jarmila Ranošová Sets of determination for parabolic functions on a half-space

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Abstract: We characterize all subsets M of $\mathbb{R}^n \times \mathbb{R}^+$ such that

$$\sup_{X \in \mathbb{R}^n \times \mathbb{R}^+} u(X) = \sup_{X \in M} u(X)$$

for every bounded parabolic function u on $\mathbb{R}^n \times \mathbb{R}^+$. The closely related problem of representing functions as sums of Weierstrass kernels corresponding to points of M is also considered. The results provide a parabolic counterpart to results for classical harmonic functions in a ball, see References. As a by-product the question of representability of probability continuous distributions as sums of multiples of normal distributions is investigated.

Keywords: heat equation, parabolic function, Weierstrass kernel, set of determination, decomposition of $L_1(\mathbb{R}^n)$, normal distribution **AMS Subject Classification:** 35K05, 35K15, 31B10, 60Exx