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NOTE ON POLY-SUPERTEMPERATURES ON A STRIP DOMAIN

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0. Introduction

Let m be a positive integer and let

$$D = \{(X,t); X = (x_1, x_2, \cdots, x_n) \in \mathbf{R}^n, 0 < t < T\}$$

be a strip domain in the $(n+1)$-dimensional Euclidean space $\mathbf{R}^{n+1}$. We consider supersolutions of the m-th iterates of the heat operator

$$H = \Delta_X - \frac{\partial}{\partial t}$$

on D. A lower semi-continuous and locally integrable function u on D is called a poly-supertemperature of degree m, if $(-H)^m u \geq 0$ on D in the sense of distributions. If u and $-u$ are both poly-supertemperatures of degree m, then u is called a poly-temperature of degree m.

In our previous paper [2] (see also [1]), we have shown the following super-mean-value property for poly-supertemperatures.

Theorem A ([2, Theorem 2]). *Let u be a C^{2m-2}-function on D satisfying the growth condition*

$$|H^k u(X,t)| \leq M e^{a|X|^2}, \quad k = 0, 1, \cdots, m-1, \tag{1}$$

with some constants $M > 0$ and $a > 0$ (here $H^0 u$ means u). If u is a poly-supertemperature of degree m on D, then

$$u(X_0, t_0) \geq A[u, c_1, c_2, \cdots, c_m](X_0, t_0) \tag{2}$$

whenever $(X_0, t_0) \in D$ and $0 < c_1 < c_2 \cdots < c_m < \min\{1/4a, t_0\}$. (For notation, see (5) below.)