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# Reverse Convolution Inequalities and Applications to Inverse Heat Source Problems

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**Abstract:** We introduce reverse convolution inequalities obtained recently and at the same time, we give new type reverse convolution inequalities and their important applications to inverse source problems. We consider the inverse problem of determining $f(t)$, $0 < t < T$, in the heat source of the heat equation $\partial_t u(x,t) = \Delta u(x,t) + f(t)\varphi(x)$, $x \in \mathbb{R}^n$, $t > 0$ from the observation $u(x_0,t)$, $0 < t < T$, at a remote point $x_0$ away from the support of $\varphi$. Under an a priori assumption that $f$ changes the signs at most $N$-times, we give a conditional stability of Hölder type, as an example of applications.