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The fundamental solution of nonlinear equations with natural growth terms

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Abstract. We find bilateral global bounds for the fundamental solutions associated with some quasilinear and fully nonlinear operators perturbed by a nonnegative zero order term with natural growth under minimal assumptions. Important model problems involve the equations $-\Delta_p u = \sigma\,|u|^{p-2}\,u + \delta_{x_0}$, for $p > 1$, and $F_k(-u) = \sigma\,|u|^{k-1}\,u + \delta_{x_0}$, for $k \geq 1$. Here Δ_p and F_k are the p-Laplace and k-Hessian operators respectively, and σ is an arbitrary positive measurable function (or measure). We will in addition consider the Sobolev regularity of the fundamental solution away from its pole.

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