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## A family of anisotropic integral operators and behaviour of its maximal eigenvalue

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We study the family of compact integral operators \$1mathbf $\mathrm{K} \_$lbeta\$ in \$L^2 ( (mathbb R)\$ with the kernel K_\beta $(x, y)=\backslash$ frac $\{1\}\{\backslash p i\} \backslash f r a c\{1\}\left\{1+(x-y)^{\wedge} 2+\right.$ lbeta^2\Theta( $\mathrm{x}, \mathrm{y}$ )\}, depending on the parameter $\$ 1$ beta $>0 \$$, where $\$ \backslash$ Theta $(x, y) \$$ is a symmetric non-negative homogeneous function of degree \$lgammalge $1 \$$. The main result is the following asymptotic formula for the maximal eigenvalue $\$ \mathrm{M}$ _lbeta\$ of $\$$ lmathbf K_lbeta\$: M_lbeta = 1 - Vlambda_1 lbeta^\{|frac\{2\}\{\gamma+1\}\} +o(lbeta^\{\frac\{2\}\{\gamma+1\}\}), \betalto 0 , where \$lambda_1\$ is the lowest eigenvalue of the operator \$ ${ }^{\text {mathbf } A=|d / d x|+~}$ ITheta( $\mathrm{x}, \mathrm{x}) / 2 \$$. A central role in the proof is played by the fact that $\$ \backslash$ mathbf K_lbeta, \beta>0,\$ is positivity improving. The case $\$ 1 \operatorname{Theta}(x, y)=\left(x^{\wedge} 2+y^{\wedge} 2\right)$ $\wedge 2 \$$ has been studied earlier in the literature as a simplified model of hightemperature superconductivity.

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