

THE KATO SQUARE ROOT PROBLEM FOLLOWS FROM AN EXTRAPOLATION PROPERTY OF THE LAPLACIAN

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Abstract: On a domain $\Omega \subseteq \mathbb{R}^d$ we consider second-order elliptic systems in divergence-form with bounded complex coefficients, realized via a sesquilinear form with domain $H_0^1(\Omega) \subseteq \mathcal{V} \subseteq H^1(\Omega)$. Under very mild assumptions on Ω and \mathcal{V} we show that the solution to the Kato Square Root Problem for such systems can be deduced from a regularity result for the fractional powers of the negative Laplacian in the same geometric setting. This extends earlier results of McIntosh [25] and Axelsson–Keith–McIntosh [6] to non-smooth coefficients and domains.

2010 Mathematics Subject Classification: 35J57, 47A60, 42B37.

Key words: Kato’s Square Root Problem, sectorial and bisectorial operators, functional calculus, quadratic estimates, Carleson measures.