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$W^{1,p}$ regularity of solutions to Kolmogorov equation with Gilbarg-Serrin matrix

In $\mathbb{R}^d$, $d \geq 3$, consider the divergence and the non-divergence form operators

$$-\Delta - \nabla \cdot (a - I) \cdot \nabla + b \cdot \nabla, \tag{i}$$

$$-\Delta - (a - I) \cdot \nabla^2 + b \cdot \nabla, \tag{ii}$$

where the second order perturbations are given by the matrix

$$a - I = c|x|^{-2} x \otimes x, \quad c > -1.$$

The vector field $b : \mathbb{R}^d \to \mathbb{R}^d$ is form-bounded with the form-bound $\delta > 0$ (this includes a sub-critical class $[L^d + L^\infty]^d$, as well as vector fields having critical-order singularities). We characterize quantitative dependence on c and δ of the $L^q \to W^{1,qd/(d-2)}$ regularity of the resolvents of the operator realizations of (i), (ii) in L^q, $q \geq 2 \vee (d-2)$ as (minus) generators of positivity preserving L^∞ contraction C_0 semigroups. This is joint work with Yu.A.Semenov (Toronto).