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Abstracts of Short Communications and Posters

Section:

10. Partial Differential Equations

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A Harnack Type Theorem for Elliptic Systems with L^∞ Coefficients

The following theorem will be presented:
" Let $\Omega \subseteq \mathbb{R}^n$ be a domain, $m \in \mathbb{N}$ and $\lambda, q > 0$. Then, there exists $r(= r(\lambda, q)) > 1$ such that for every $0 < p < q$, whenever $\vec{u}_1, \vec{u}_2, ..., \vec{u}_m$ are weak solutions of a strongly elliptic system with m equations of ellipticity λ satisfying $(\vec{u}_1\vec{u}_2...\vec{u}_m) \in \mathcal{P}_r$ a. e. and $\Omega' \subseteq \Omega$ subdomain, the following inequalities hold:

$$\sup_{1\leq j\leq m} \| |\vec{u_j}| \|_{L^q(\Omega')} \leq C \inf_{1\leq j\leq m} \| |\vec{u_j}| \|_{L^p(\Omega')}$$

$$\sup_{1\leq j\leq m} \| |\vec{u_j}|^{-1} \|_{L^q(\Omega')} \leq C \inf_{1\leq j\leq m} \| |\vec{u_j}|^{-1} \|_{L^p(\Omega')}$$

where $C(= C(n, m, \lambda, q, p, \Omega, \Omega'))$ is a positive constant. "
Here "$(\vec{u}_1\vec{u}_2...\vec{u}_m) \in \mathcal{P}_r$" means that the matrix whose j-th column is $\vec{u_j}$ satisfies a certain "uniform positiveness" assumption. Examples concerning the sharpness of the result will also be discussed.
Reference: C. Muscalu: On Harnack Principle for Strongly Elliptic Systems with Non-smooth Coefficients, preprint March 1998.