1046-35-209 **Tunde Jakab*** (tj8y@virginia.edu), Mathematics Department, Kerchof Hall, PO Box 400137, University of Virginia, Charlottesville, VA 22904-4137, **Irina Mitrea**, Mathematics Department, Kerchof Hall, PO Box 400137, University of Virginia, Charlottesville, VA 22904-4137, and **Marius Mitrea**, Mathematics Department, 330 Mathematical Sciences Building, University of Missouri, Columbia, MO 65211. *Differential forms with mixed boundary conditions.*

Let $\Omega \subset \mathbb{R}^n$ be a bounded Lipschitz domain, whose boundary decomposes into two disjoint pieces Σ_t, $\Sigma_n \subseteq \partial\Omega$, which meet at an angle $< \pi$. Denote by ν the outward unit normal to Ω. Then there exists $\varepsilon > 0$ with the property that if $|2-p| < \varepsilon$ then the following holds. Consider a vector field u with components $u_1, ..., u_n \in L^p(\Omega)$ such that $\operatorname{div} u = \sum_{j=1}^n \partial_j u_j \in L^p(\Omega)$ and $\operatorname{curl} u = (\partial_j u_k - \partial_k u_j)_{1\leq j,k\leq n} \in L^p(\Omega)$. Set $\nu \cdot u = \sum_{j=1}^n \nu_j u_j$ and $\nu \times u = (\nu_j u_k - \nu_k u_j)_{1\leq j,k\leq n}$. Then the following are equivalent:

(i) $(\nu \cdot u)\big|_{\Sigma_t} \in L^p(\Sigma_t)$ and $(\nu \times u)\big|_{\Sigma_n} \in L^p(\Sigma_n)$;

(ii) $\nu \cdot u \in L^p(\partial\Omega)$;

(iii) $\nu \times u \in L^p(\partial\Omega)$.

This generalizes earlier work dealing with the case when $\Sigma_t = \emptyset$ or $\Sigma_n = \emptyset$. (Received August 19, 2008)