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Khaldoun Al-Yasiri* (alyasiri@msu.edu), 619 Red cedar Rd., C 537 Wells Hall, E. Lansing, MI 48824, and **Zhengfang Zhou**. *Elliptic estimates for solutions to divergence form elliptic equations with piecewise constant coefficients in dimension n by using integral equation method.*

In a bounded C^{1,α_0} domain $\Omega \subset \mathbb{R}^n$ that contains two C^{1,α_0} subdomains, $0 < \alpha_0 \leq 1$, where the subdomains are separated from the boundary of Ω , we consider an elliptic equation in divergence form with piecewise constant coefficients. The solution of the elliptic equation has an integral representation in terms of potential functions defined on the boundary of each subdomain when the subdomains are separated from each other. We derive a uniform piecewise $C^{1,\alpha}$, $0 < \alpha < \alpha_0$, estimates for this solution which are independent of the distances between the subdomains. This extends the earlier results for $n = 2$. (Received January 20, 2015)