1011-28-116 **William P Ziemer*** (ziemer@indiana.edu), Bloomington, IN 47405. *The Gauss Green theorem for a bounded vector field whose divergence is a measure.* Preliminary report.

Let $E \subset \mathbb{R}^n$ be a set of finite perimeter; that is, the characteristic function of E is a BV function. The now classical result of DeGiorgi-Federer states that

$$\int_E \div F\, dx = \int_{\partial^* E} F \cdot \nu \, dH^{n-1}$$

where $F : \mathbb{R}^n \to \mathbb{R}^n$ is Lipschitz and where $\nu(y)$ is the measure-theoretic normal to E at y. We will discuss the material related to and surrounding the following result:

Theorem Let $F \in L^\infty(\mathbb{R}^n, \mathbb{R}^n)$ be a field whose divergence is a measure, μ, and let E be a bounded set of finite perimeter. Then, there exists an H^{N-1}-integrable function $F_{\mathrm{tr}} \in L^\infty(\partial^* E)$, called the normal trace, such that

$$\mu(E) = \int_E \div F = \int_{\partial^* E} F_{\mathrm{tr}}(y) \cdot \nu(y)\, dH^{N-1}(y).$$

Moreover, $\|F_{rm-tr}\|_\infty \leq \|F\|_\infty$. (Received August 19, 2005)