1056-35-978 **Shusen Ding*** (sding@seattleu.edu), Department of Mathematics, Seattle University, Seattle, WA 98122. *Norm Estimates for Composite Operators Applied to Harmonic Forms.* Preliminary report.

In this presentation, we will discuss the singular integrals of composite operators, such as the homotopy operator T and Green's operator, applied to the harmonic forms in a domain $\Omega \subset \mathbf{R}^n$. We all know that the harmonic forms are differential forms satisfying some version of the harmonic equation. In this talk, we study the differential forms satisfying the nonlinear partial differential equation $d^\star A(x, du) = B(x, du)$ which is called the non-homogeneous A-harmonic equation, where $A : \Omega \times \wedge^l(\mathbf{R}^n) \to \wedge^l(\mathbf{R}^n)$ and $B : \Omega \times \wedge^l(\mathbf{R}^n) \to \wedge^{l-1}(\mathbf{R}^n)$ satisfy the conditions: $|A(x, \xi)| \le a|\xi|^{p-1}$, $A(x, \xi) \cdot \xi \ge |\xi|^p$ and $|B(x, \xi)| \le b|\xi|^{p-1}$ for almost every $x \in \Omega$ and all l-forms ξ. Here $\wedge^l(\mathbf{R}^n)$ is the set of all differential l-forms defined in $\mathbf{R}^n$, $a, b > 0$ are constants and $1 < p < \infty$ is a fixed exponent associated with the non-homogeneous A-harmonic equation. (Received September 19, 2009)