1116-42-187 **Christopher Ryan Loga*** (loga@math.utk.edu), 2734 Bakertown Rd., Apt. 18, Knoxville, TN 37931. *An Extension Theorem for Matrix Weighted Sobolev Space on a Lipschitz Domain.* Preliminary report.

Let $D \subset \mathbb{R}^n$ be a bounded Lipschitz domain and $1 < p < \infty$. Suppose for each $x \in \mathbb{R}^n$ that $W(x)$ is an $m \times m$ positive definite matrix which satisfies the matrix A_p condition. For $k = 0, 1, 2, 3, ...$ define the matrix weighted, vector valued, Sobolev space $L^p_k(D, W)$ with norm

$$\left|\left|\overrightarrow{f}\right|\right|^p_{L^p_k(D,W)} = \sum_{|\alpha| \leq k} \int_D \left|\left|W^{1/p}\left(D^\alpha \overrightarrow{f}\right)\right|\right|^p \mathrm{d}x$$

where $\overrightarrow{f} = (f_1, \ldots, f_m) : D \to \mathbb{C}^m$. We show that for $\overrightarrow{f} \in L^p_k(D, W)$ there exists an extension $E\left(\overrightarrow{f}\right) \in L^p_k(\mathbb{R}^n, W)$ such that $E\left(\overrightarrow{f}\right) = \overrightarrow{f}$ on D and

$$\left|\left|E\left(\overrightarrow{f}\right)\right|\right|_{L^p_k(\mathbb{R}^n,W)} \leq C \left|\left|\overrightarrow{f}\right|\right|_{L^p_k(D,W)}$$

for some constant independent of $\overrightarrow{f}$. This generalizes a known result for scalar A_p weights. (Received August 12, 2015)