1097-46-196 **Teffera M Asfaw*** (teffera6@vt.edu), Department of Mathematics, Virginia Polytechnic Institute and State Univ, McBryde Hall 576, Blacksburg, VA VA 24061. *New surjectivity results for perturbed weakly coercive operators of monotone type in reflexive Banach space.* Preliminary report.

Let X be a real reflexive locally uniformly convex Banach space with locally uniformly convex dual X^*. Let $T : X \supseteq D(T) \to 2^{X^*}$ be maximal monotone and $S : X \to 2^{X^*}$ be bounded pseudomonotone. Let p be a nonnegative integer. Assume, further, that there exist nonnegative constants $a_i (i = 1, 2, ..., p)$ such that

$$< v^* + w^*, x > \geq -\sum_{i=1}^{p} a_i \|x\|^i - \alpha(\|x\|)\|x\|^{p+2}$$

for all $x \in D(T)$ with sufficiently large $\|x\|$, $v^* \in Tx$ and $w^* \in Sx$, where $\alpha : [0, \infty) \to [0, \infty)$ such that $\alpha(t) \to 0$ as $t \to \infty$. New surjectivity results are given for the operator $T + S$ along with weakly coercive type hypothesis on $T + S$. The results are new and improve the corresponding theory for coercive operators of monotone type. The theory developed herein can be suitably applied in the study of partial differential equations, variational and hemi-variational inequality problems in appropriate Sobolev spaces. To demonstrate the applicability of the theory, an example of time periodic parabolic partial differential equation, which models nonmonotone semipermeability problem, is provided. (Received January 21, 2014)