1047-13-83 **Satya Mandal*** (mandal@math.ku.edu), Department of Mathematics, University of Kansas, Lawrence, KS 66045, and **Albert Sheu**. *Real affine varieties and obstruction theories.*

Let $X = Spec(A)$ be a real smooth affine variety with $\dim X = n \geq 2$, $K = \wedge^n \Omega_{A/\mathbb{R}}$ and L be a rank one projective $A-$module. Let $E(A, L)$ denote the Euler class group and M be the manifold of X. (For this talk we assume M is compact.) Recall that any rank one projective $A-$module L induces a bundle of groups $\mathcal{G}_L$ on M associated to the corresponding line bundle on M. In this talk, we establish a cannonical homomorphism

$$\zeta : E(A, L) \to H_0(M, \mathcal{G}_{LK^*}) H^n(M, \mathcal{G}_{L^*}),$$

where the notation H_0 denotes the 0^{th} homology group and H^n denotes the $n^{th}-$cohomology group with local coefficients in a bundle of groups. In fact, the isomorphism $H_0(M, \mathcal{G}_{LK^*}) H^n(M, \mathcal{G}_{L^*})$ is given by Steenrod's Poincaré duality. Further, we prove that this homomorphism ζ factors through an isomorphism

$$E(\mathbb{R}(X), L \otimes \mathbb{R}(X)) H_0(M, \mathcal{G}_L)$$

where $\mathbb{R}(X) = S^{-1}A$ and S is the multiplicative set of all $f \in A$ that do not vanish at any real point of X. (Received January 17, 2009)