1086-19-2689 **Mio I Alter*** (`malter@math.utexas.edu`). *Differential Circle Equivariant K-theory.* Preliminary report.

Differential cohomology theories of smooth manifolds geometrically refine classical cohomology theories by combining differential forms and integral cocycles to obtain local geometric and global topological information. Whereas the topological K-theory $K^0(M)$ is the ring of isomorphism classes of vector bundles, the differential K-theory $\widehat{K}^0(M)$ consists of isomorphism classes of vector bundles with connection. When a smooth manifold M carries a smooth action of the circle group $\mathbb{T}$, equivariant K-theory, the K-theory of $\mathbb{T}$-equivariant vector bundles, captures equivariant topological information. We recall the Freed-Lott construction of differential K-theory and present a construction of differential $\mathbb{T}$-equivariant K-theory which captures equivariant geometric and topological information at once. (Received September 25, 2012)