1122-05-22 **Yun Fan**, Wuhan,, 430079, Peoples Rep of China, and **Bangteng Xu*** (bangteng.xu@eku.edu), 521 Lancaster Avenue, Richmond, KY 40475. *Nonlinear functions and difference sets on group actions.*

Let G be a finite abelian group acting on a finite set X. G-bent functions on X and G-difference sets of X are generalizations of bent functions on G and difference sets of G, respectively. We introduce the notion of a G-dual set $\widehat{X}$ of X, which plays a role similar to the dual group $\widehat{G}$ of G. For any T-valued function f on X, where T is the unit circle in the complex plane, we define the Fourier transform $\widehat{f}$ of f as a function on $\widehat{X}$. Then we characterize a G-bent function f in terms of its Fourier transform $\widehat{f}$, and a G-difference set of X by a normalized G-dual set. Constructions of G-bent functions and G-perfect nonlinear functions will also be discussed. (Received July 14, 2016)