1052-20-49 **Ming-hsuan Kang*** (kmsming@gmail.com), 2302 Plaza Drive, State College, PA 16801. *Zeta Functions of Complexes.*

We define and investigate the properties of the zeta functions on the complex, which arises from a finite quotient of the affine Bruhat-Tits building on a general linear group over a local function field. Briefly speaking, for each type of simplex of dimension k, we define a zeta function which counts the number of k-dimensional closed straight geodesics containing the simplex of that type.

Several important properties of zeta functions are concluded as follows. First, these zeta functions are rational functions and have closed-form expressions in terms of parahoric Hecke operators. Second, the alternating production of the zeta functions satisfies an identity which is involved in the Euler characteristic of the complex. Finally, we show that the Ramanujan property of complexes is equivalent to the condition on the absolute values of zeta functions' roots. (Received August 10, 2009)