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Anisotropic Dirac Fermions in $BaMnBi_2$ and $BaZnBi_2$[1] HYEJIN RYU, ALS, Lawrence Berkeley National Lab., Berkeley, CA 94720, US. Max Plank POSTECH Center for Complex Phase Materials, POSTECH, Korea., SE YOUNG PARK, Dept. of Phys. Astro, Rutgers U., Piscataway, NJ 08854, US., LIJUN LI, Condensed Matt. Phys. and Materials Science Dept, Brookhaven National Lab., Upton, NY 11973, US, WEIJUN REN, CMPMSD, Brookhaven National Lab., Upton, NY 11973, US and Shenyang National Lab. for Materials Science, Inst. of Metal Research, CAS, China., CEDOMIR PETROVIC, CMPMSD, Brookhaven National Lab., Upton, NY 11973, US, CHOONKYU HWANG, Dept. of Phys., Pusan National U., Busan 609-735, Korea. Max Plank POSTECH Center for Complex Phase Materials, POSTECH, Korea., SUNG-KWAN MO, ALS, Lawrence Berkeley National Lab., Berkeley, CA 94720, US — We report electronic structures of $BaMnBi_2$ and $BaZnBi_2$ sharing similar structural properties but having different valence configuration of the Mn/Zn-Bi complex. Our angle-resolved photoemission measurements found a strong anisotropic Dirac dispersion in $BaMnBi_2$ and a complete departure from the Dirac dispersion in $BaZnBi_2$. Our findings, substantiated by the first principle calculations, allow us to understand role of Mn/Zn-Bi tetrahedra in the changes of the electronic structures as well as the effect of varying band filling of Bi-square net.

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