Supplemental Information file for the paper entitled:

Giant Rashba-Splitting of One-Dimensional Metallic States in Bi Dimer Lines on InAs(100)

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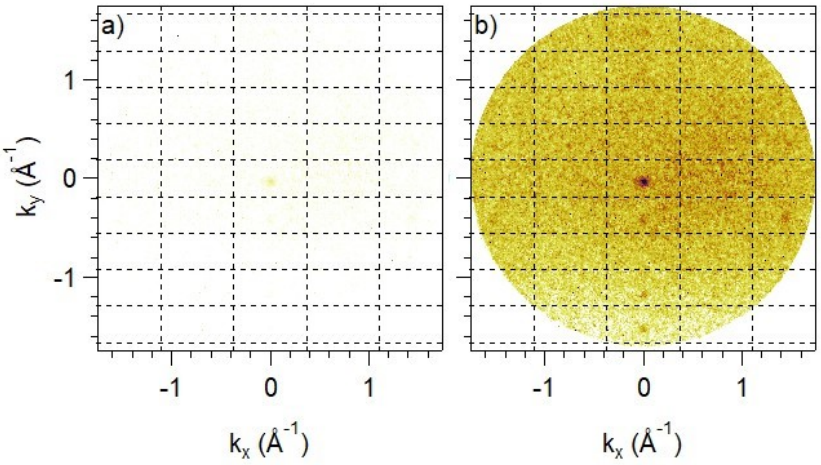

Fig. S1. *Constant energy cut (0.15 eV below E_F) of the photoelectron signal of the (4×2)/c(8×2)-terminated InAs(100) substrate taken with the momentum microscope under the same experimental conditions of Fig. 3(a). The color scale in panel (a) is the same of Fig. 3(a), while panel (b) uses a color scale that enhances very low intensity electronic features. The dashed lines indicate the edges of the (4×2) SBZ. The small circles are charge accumulation states derived from the InAs conduction band. These states are visible at some* $\bar{\Gamma}$ *points of (4×2) SBZs, which are also* $\bar{\Gamma}$ *points of the hexagonal-like c(8×2) SBZs (not shown).*

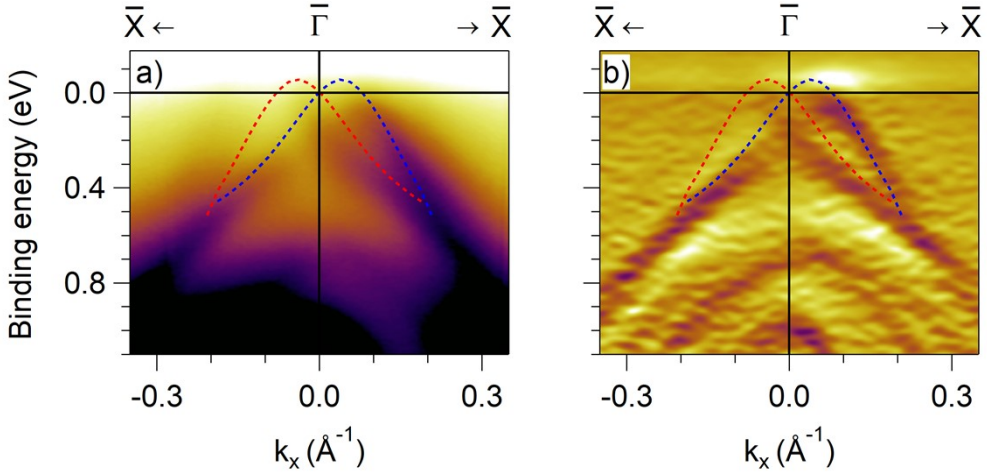

Fig. S2. *ARPES spectra taken at the BaDElPh beamline with hv = 22 eV along the same segment probed in Fig. 3(e) and corresponding to the* $\bar{X}$–$\bar{\Gamma}$–$\bar{X}$ *direction. Panels (a) and (b) report the original and second derivative data, respectively. The slight discrepancy with the*

calculated S_3 and S_4 bands (dashed lines) can indicate a larger α_R value in the experiment than in the theory.

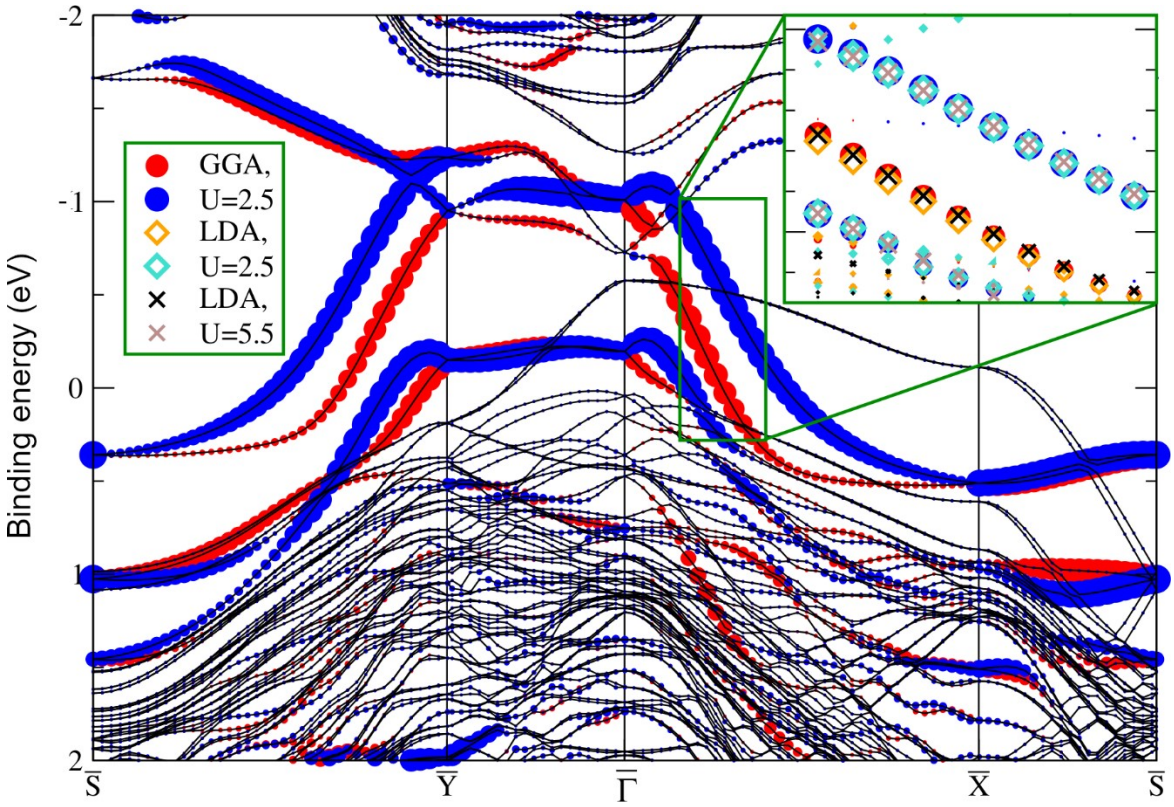

Fig. S3. *Spin-resolved DFT calculations with the same computational parameters as in the main text but using GGA [1] as exchange correlation functional. The size of the symbols is proportional to the in-plane component of the spin polarization perpendicular to the k-vector. The zoom shows the details of the S1/S2 bands calculated using GGA and using LDA with different U terms (to introduce the local potential on the p-states) that show marginal differences.*

References

[1] J. P. Perdew, K. Burke, and M. Ernzerhof, Generalized gradient approximation made simple, Phys. Rev. Lett. **77**, 3865 (1996).