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Tc amplification in pnictides due to Feshbach shape resonance in multigap superconductivity realized by tuning the Fermi level at the electronic topological transiton to one of the subbands ANTONIO BIANCONI, Sapienza University of Rome, Italy, DAVIDE INNOCENTI, Sapienza University of Rome, NICOLA POCCIA, Sapienza University of Rome, Italy, ALESSANDRO RICCI, Sapienza University of Rome — The new high Tc superconducting Pnictides AFe2As2 (A=Ba,Sr or Ca) are heterostructures at atomic limit like cuprates as described in the patent [A. Bianconi "Process of increasing the critical temperature Tc of a bulk superconductor by making metal heterostructures at the atomic limit" United State Patent No. :US6, 265, 019 B1, July 24, 2001] in fact are made of superconducting layers intercalated by spacer layers. (R. Caivano, et al., Superconductor Science and Technology 22, 014004+ (2009), A. Ricci et al. Journal of Superconductivity and Novel Magnetism 22, 589 (2009)) where the Fermi level is tuned to a electronic topological transition in one of the subbands by doping, pressure or substitutions. Here we present the calculation of the Tc amplification by shape resonance or Feshbach resonance in a superlattice of layers in a narrow range where the chemical potential is tuned to the electronic topological transition as measured recently by NMR (H. Shishido et al. arXiv:0910.3634v1). The computer code tested now in the diborides and pnicitdes can be used for material design of new high Tc superconductors.

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