Tailoring the spin direction of antiferromagnetic NiO thin films grown on vicinal Ag(001) B. SINKOVIC, Phys. Depart., Univ. of Connecticut, Storrs, Y.Z. WU, Phys. Depart., U.C. Berkeley, Y. ZHAO, Phys. Depart., Univ. of Connecticut, Storrs, Z.Q. QIU, Phys. Depart., U.C. Berkeley — NiO is one of the most intensively studied antiferromagnetic materials to study the exchange bias effect. It was shown recently that the spin direction of a NiO thin film can be manipulated between out-of-plane and in-plane directions by growing NiO on MgO(001) and Ag(001). Here we report that we realized the manipulation of NiO spin direction in the plane of the film by growing NiO on a vicinal Ag(001) surface. X-ray Magnetic Linear Dichroism (XMLD) was used to measure the NiO spin directions. We found that the NiO film grown on vicinal Ag(001) surface has an in-plane uniaxial magnetic anisotropy which favors the NiO spin parallel to the steps for <100> vicinal surface or perpendicular to the steps for <110> vicinal surface. Moreover, we observed the XMLD effect from the NiO L3 edge, which further support the magnetic origin of the XMLD effect in our sample.