

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Visualizing spin-dependent scattering in strong spin-orbit systems** ANNA STROZECKA, Institute of Experimental Physics, Free University Berlin, Germany, ASIER EIGUREN, Dpto. Fisica de la Materia Condensada, Universidad del Pais Vasco, Bilbao, Spain, JOSE IGNACIO PASCUAL, Institute of Experimental Physics, Free University Berlin, Germany — For surfaces which exhibit spin-orbit coupling, electrons originating from spin polarized surface bands are protected against backscattering by time reversal symmetry. Electron interference patterns observed in STM confirm the chiral spin texture of the surface Fermi contours of such materials and reveal the dominant role of spin in the scattering processes. Using a combined experimental and theoretical approach, we distinguish the role of spin in the electron scattering processes on Bi(110). Utilizing spectroscopic imaging of the local density of states, we studied the energy dependence of the interference patterns formed around single adsorbates. Simulations based on Green's functions correctly reproduce the interference patterns, unveiling the role of spin in the interference process and allowing identification of the dominant scattering events.

Anna Strozecka  
Institute of Experimental Physics, Free University Berlin, Germany

Date submitted: 18 Nov 2010

Electronic form version 1.4