Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Topologically protected surface Majorana arcs and bulk Weyl fermions in ferromagnetic superconductors[1] SUMANTA TEWARI, Department of Physics and Astronomy, Clemson University, Clemson, SC 29634, JAY SAU, Department of Physics, Harvard University, Cambridge, MA 02138 — A number of ferromagnetic superconductors have been recently discovered which are believed to be in the so-called "equal spin pairing" (ESP) state. In the ESP state the Cooper pairs condense forming order parameters $\Delta_{\uparrow,\uparrow}, \Delta_{\downarrow\downarrow}$, which are decoupled in the spin-sector. We show that these 3D systems generically support topologically protected surface Majorana arcs and bulk Weyl fermions as gapless excitations. Similar protected low-energy exotic quasiparticles should also appear in the recently discovered non-centrosymmteric superconductors in the presence of a Zeeman field. The protected surface arcs can be probed by angle-resolved photoemission (ARPES) as well as fourier transform scanning tunneling spectroscopty (FT-STS) experiments.

[1]Work Supported by DARPA-MTO, NSF, and Harvard Quantum Optics Center

Sumanta Tewari
Department of Physics and Astronomy,
Clemson University, Clemson, SC 29634

Date submitted: 06 Dec 2011 Electronic form version 1.4