Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Large Area Transfer and Optoelectronic Properties of Multilayer Epitaxial Germanane WALID AMAMOU, PATRICK ODENTHAL, University of California Riverside, BETH BUSHONG, The Ohio State University, DANTE O'HARA, University of California Riverside, YUNQIU LUO, The Ohio State University, JEREMIAH VAN BAREN, University of California Riverside, IGOR PINCHUK, The Ohio State University, YI WU, MARC BOCKRATH, HARRY TOM, University of California Riverside, JOSHUA GOLDBERGER, ROLAND KAWAKAMI, The Ohio State University — Germanane (GeH), the germanium-based analog of graphane (CH), is of particular interest due to its direct band gap and surface covalent functionalization. Furthermore, its large spin orbit coupling makes it possible to explore novel physical phenomena such as quantum spin hall effect at room temperature. Currently, large area GeH films are synthesized on Ge(111) wafers using substrate reaction or molecular beam epitaxy combined with chemical processing. This results in a high quality GeH film that is left on top of the germanium substrate. In order to perform the electrical characterization of GeH, it is required to transfer the film to an insulating substrate. Here, we demonstrate a highly efficient, nondestructive electrochemical route for the transfer of molecular beam epitaxy (MBE) GeH film from Ge(111) surfaces. This technique enables us to characterize the optoelectronic properties of epitaxial GeH after transfer such as I-V characteristics and photoconductivity wavelength dependence.

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Date submitted: 14 Nov 2014 Electronic form version 1.4