Abstract Submitted
for the TSF15 Meeting of
The American Physical Society

Progress in graphene experiments: Suspended graphene and spin injection[1] BIN YANG, Physics and Astronomy, Texas A&M University, JAE HYOUNG SON, Material Science and Eng., Texas A&M University, SUNG OH WOO, Physics and Astronomy, Texas A&M University, W. TEIZER, Physics and Astronomy, Material Science and Eng,Texas A&M University. WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan — Graphene has been found to be a very promising material due to its unusual electrical, thermal and mechanical properties. Electrons in graphene can be described by the massless Dirac equation and their mobility can be as high as several thousand $cm^2V^{-1}s^{-1}$. Besides its electronic transport properties, graphene is also a promising material for spintronics, due to its low spin-orbit interaction. A clear spin accumulation at the interface between a ferromagnet and graphene was observed during spin injection. Recently, it has been found that a spin current can be induced by heat flow from a ferromagnet into a semiconductor, in analogy to an electric flow. Here, we are reporting on initial work on an experiment intended to inject a pure spin current from a ferromagnet into graphene, driven by a heat current, a novel approach for graphene. In addition, we have produced suspended graphene bridges that can be electronically investigated. The release of the graphene has been achieved by patterning suitable electrodes, which serve as contacts and concomitantly protect the two ends of a rectangular graphene flake from a subsequent undercut etch, partially performed under supercritical conditions.

[1]We thank the WPI Program, MEXT Japan for financial support.

Bin Yang
Physics and Astronomy, Texas A&M University

Date submitted: 08 Oct 2015 Electronic form version 1.4