

Abstract Submitted
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High temperature Graphene-based Quantum Hall Effect Infrared photodetector¹ NIKOLAI G. KALUGIN, New Mexico Tech, LEI JING, WENZHONG BAO, UC-Riverside, LEE WICKEY, CHRISTOPHER DEL BARGA, MEKAN OVEZMYRADOV, New Mexico Tech, ERIC A. SHANER, SNL, CHUNNING LAU, NEW MEXICO TECH TEAM, UC-RIVERSIDE TEAM, SNL COLLABORATION — We demonstrate successful operation of quantum Hall effect (QHE) graphene-based detectors at 70K, a temperature achievable using simple pumped liquid Nitrogen cryostats, and in magnetic field of 7.35T. Because of graphene's unique band structure, the first few Landau levels are well-separated energetically, thus allowing observation and manipulation of QHE at unprecedentedly high temperatures [1]. Our results overcome the obstacle of low operating temperature of traditional semiconductor systems-based QHE photodetectors [2], and open the door for wide arrays of applications.

[1] K.S. Novoselov *et al.* *Science* **315**, 1379 (2007).

[2] N. G. Kalugin *et.al.* *Phys.Rev.B* 66, 085308 (2002).

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