



*Supplementary Materials*

# RHEED Study of the Epitaxial Growth of Silicon and Germanium on Highly Oriented Pyrolytic Graphite

Kirill A. Lozovoy <sup>1,\*</sup>, Vladimir V. Dirko <sup>1</sup>, Olzhas I. Kukenov <sup>1</sup>, Arseniy S. Sokolov <sup>1</sup>, Konstantin V. Krukovskii <sup>2</sup>, Mikhail S. Snegerev <sup>3</sup>, Alexey V. Borisov <sup>3</sup>, Yury V. Kistenev <sup>3,4</sup> and Andrey P. Kokhanenko <sup>1</sup>

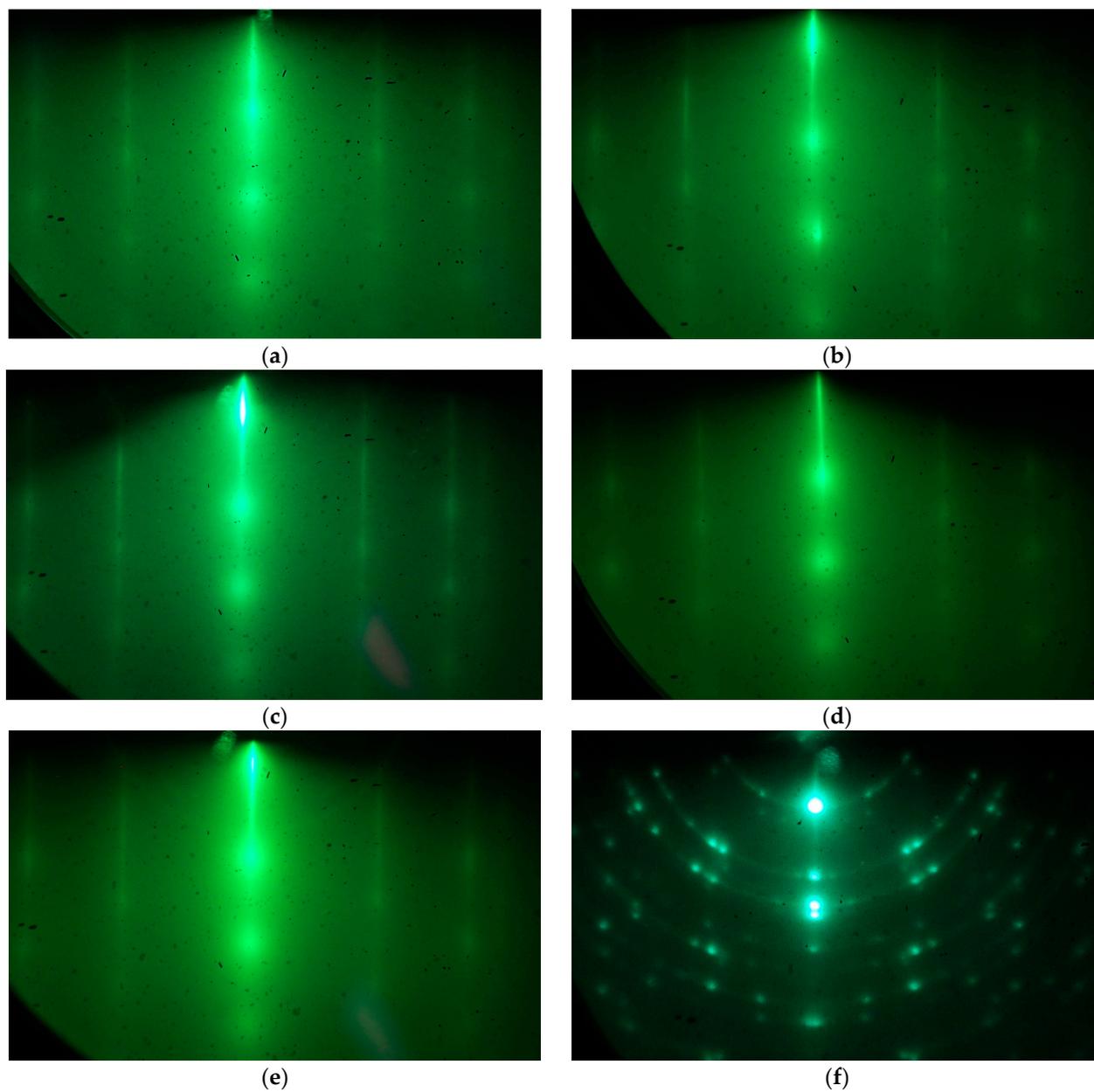
<sup>1</sup> Department of Quantum Electronics and Photonics, Faculty of Radiophysics, National Research Tomsk State University, Lenin Av. 36, 634050 Tomsk, Russia; vovenmir@gmail.com (V.V.D.); okukenov@mail.ru (O.I.K.); ars856570@gmail.com (A.S.S.); kokh@mail.tsu.ru (A.P.K.)

<sup>2</sup> Institute of Strength Physics and Materials Science of Siberian Branch of Russian Academy of Sciences, Akademicheskii Av. 2/4, 634055 Tomsk, Russia; kvk@ispms.ru

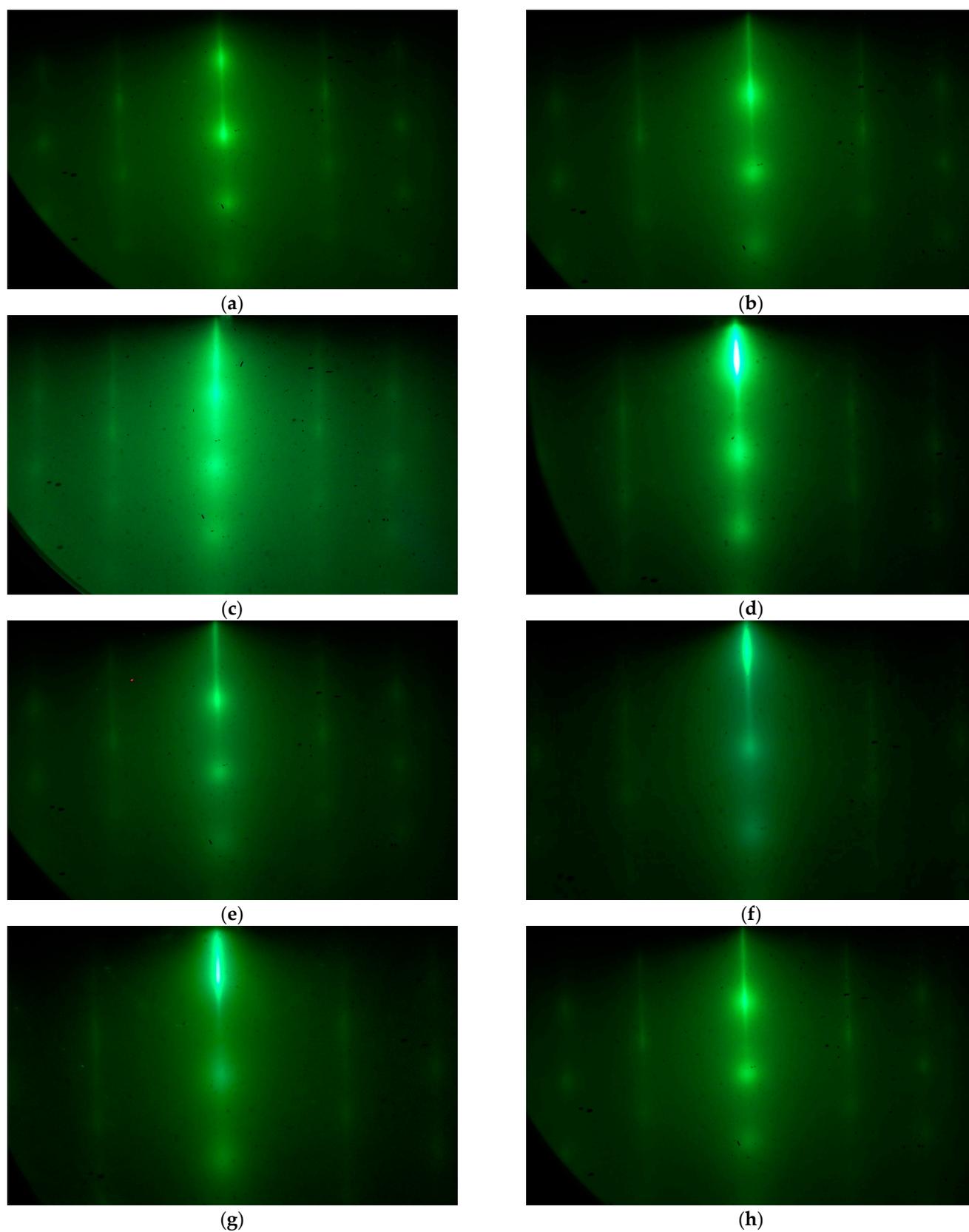
<sup>3</sup> Laboratory of Biophotonics, National Research Tomsk State University, Lenin Av. 36, 634050 Tomsk, Russia; snegerev@mail.tsu.ru (M.S.S.); borisov@phys.tsu.ru (A.V.B.); yuk@iao.ru (Y.V.K.)

<sup>4</sup> Institute of Atmospheric Optics of Siberian Branch of Russian Academy of Sciences, Academician Zuev Sq. 1, 634055 Tomsk, Russia

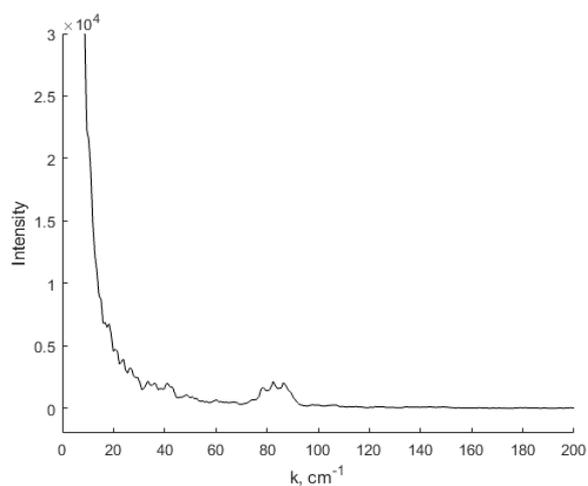
\* Correspondence: lozovoymailbox@gmail.com



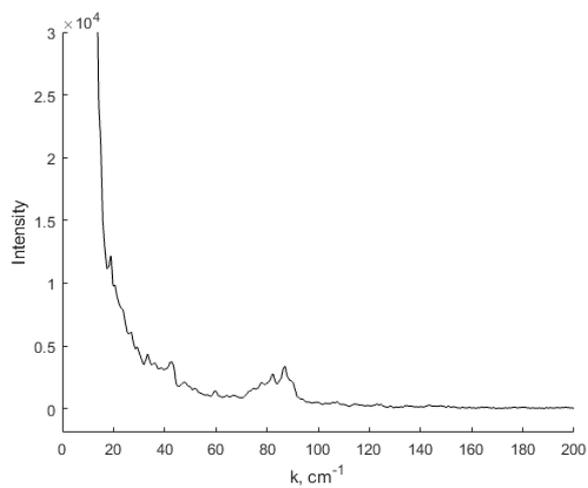
**Figure S1.** The characteristic diffraction pattern formed from a) clean HOPG surface; b) Si/HOPG surface, growth temperature 100 °C, effective thickness of the deposited silicon 1 ML; c) Si/HOPG, 200 °C, 1 ML; d) Si/HOPG, 400 °C, 1 ML; e) Si/HOPG, 650 °C, 1 ML; f) HOPG surface after annealing silicon at 800 °C.



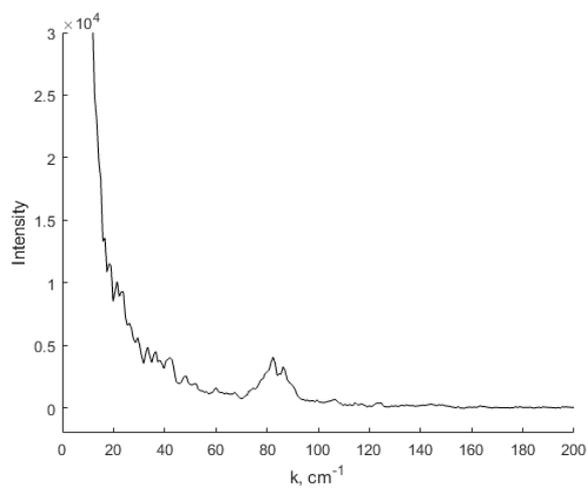
**Figure S2.** The characteristic diffraction pattern formed from a) Ge/HOPG surface, growth temperature 170 °C, effective thickness of deposited germanium 2 ML; b) Ge/HOPG, 250 °C, 1 ML; c) Ge/HOPG, 400 °C, 1 ML; d) Ge/HOPG, 500 °C, 20 ML; e) Ge/HOPG, 600 °C, 20 ML; f) Ge/HOPG, 720 °C, 20 ML; g) Ge/HOPG, 300 °C, 1 ML; h) Ge/HOPG, 260 °C, 1 ML, deposition rate 0.01 ML/s.



**Figure S3.** Low-frequency Raman spectra of the HOPG substrate.



**Figure S4.** Low-frequency Raman spectra of 3ML Si/HOPG sample.



**Figure S5.** Low-frequency Raman spectra of 10 ML Ge/HOPG sample.