

Hybrid GaAs/AlGaAs nanowire – quantum dot system for single photon sources

© G.E. Cirlin^{1,2,3,4}, R.R. Reznik^{1,2,3,4}, I.V. Shtrom^{1,3}, A.I. Khrebtov^{1,2}, Yu.B. Samsonenko^{1,2,3}, S.A. Kukushkin⁵, T. Kasama⁶, N. Akopian⁶

¹ St. Petersburg Academic University, Russian Academy of Sciences, 194021 St. Petersburg, Russia

² ITMO University, 197101 St. Petersburg, Russia

³ Institute for Analytical Instrumentation, Russian Academy of Sciences, 190103 St. Petersburg, Russia

⁴ Peter the Great Saint Petersburg Polytechnic University, 195251 St. Petersburg, Russia

⁵ Institute of Problems of Mechanical Engineering, Russian Academy of Sciences, 199178 St. Petersburg, Russia

⁶ DTU Photonics, Technical University of Denmark, Kgs. Lyngby, Denmark 2800

E-mail: cirlin@beam.ioffe.ru

III–V nanowires, or a combination of the nanowires with quantum dots, are promising building blocks for future optoelectronic devices, in particular, single-photon emitters, lasers and photodetectors. In this work we present results of molecular beam epitaxial growth of combined nanostructures containing GaAs quantum dots inside AlGaAs nanowires on a silicon substrate showing a new way to combine quantum devices with Si technology.

Acknowledgements

We are grateful for the support of the Ministry of education and science of Russian Federation (state task, project No 16.2483.2017/4.6). The nanowire samples were grown under the support of Russian Science Foundation (Project No 14-12-00393).