Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Optical spectroscopy and photo modification of individual single-photon emitters in hexagonal boron nitride HARISHANKAR JAYAKUMAR, ZAV SHOTAN, CHRISTOPHER CONSIDINE, City College of CUNY, MAENA MAZKOIT, Center for Physical Sciences and Technology, Vilnius LT-01108, Lithuania, HELMUT FEDDER, JOERG WRACHTRUP, 3rd Physics Institute, University of Stuttgart, 70569 Stuttgart, Germany, AUDRIUS ALKAUSKAS, Center for Physical Sciences and Technology, Vilnius LT-01108, Lithuania, MARCUS DOHERTY, Laser Physics Centre, Research School of Physics and Engineering, Australian National University, Canberra, VINOD MENON, CARLOS MERILES, City College of CUNY — Fluorescent defects recently observed under ambient conditions in hexagonal boron nitride (h-BN) promise to open novel opportunities for the implementation of on-chip photonic devices that rely on identical photons from single emitters. Here we report on the room temperature photo-luminescence dynamics of individual emitters in multilayer h-BN flakes exposed to blue laser light. Comparison of optical spectra recorded at successive times reveals considerable spectral diffusion, possibly the result of slowly fluctuating, trapped-carrier-induced stark shifts. Large spectral jumps — reaching up to 100 nm — followed by bleaching are observed in most cases upon prolonged exposure to blue light, an indication of one-directional, photo-chemical changes likely taking place on the flake surface. Remarkably, only a fraction of the observed emitters also fluoresces on green illumination suggesting a more complex optical excitation dynamics than previously anticipated and raising questions on the physical nature of the atomic defect at play.

Harishankar Jayakumar
City College of CUNY

Date submitted: 11 Nov 2016 Electronic form version 1.4