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POSTER

	NAME	TITLE	ABSTRACT
1	**Dr. Toshiyuki Tashima, Ludwig Maximilians University Munich, Germany**	Towards single photon generation using NV centers in diamond coupled to thin layer optical waveguides	Single photon emitters like the nitrogen-vacancy (NV) center in diamond are important for quantum communication such as quantum cryptography and quantum metrology. In this context, e.g. tapered optical nano-fibers are a promising approach as they allow efficient coupling of single photons into a single spatial mode [F. l. Kien et al, PRA 72, 032509 (2005) / R. Yalla, et al, PRL 109 063602 (2012)]. Yet, integration of such fibers in a compact integrated quantum circuit is demanding. Here we propose a NV defect center in diamond as a single photon emitter coupled to a thin layer photonic waveguide. The benefit is to allow smaller size devices while having a similar strong evanescent field like tapered nano-optical fibers. We present numerical simulations and fabrication steps of such structures.
2	**Mr. Yuki Doi,** Osaka University, Japan	Single Photon, Spin, and Charge in Diamond Semiconductor at Room Temperature	The nitrogen-vacancy (NV) center in diamond is a promising candidate for a qubit driven at room temperature. In order to derive potential of NV center, manipulation of their charge state is a very important topic. Here we succeeded to electrically control between single NV-/NV0 by means of current injection. This method arrows us to very stable charge state control.
3	**Dr. Frederico Brandao,** Technische Universität Dortmund	A comparative study on optical and magnetic resonance properties of near-surface NV centers in nano and bulk diamond	Using shallow nitrogen-vacancy (NV) centers in diamond for applications in magnetometry requires the generation of stable defects in the NVå charge state in sufficiently high density and high quality spin properties. Recent studies reported about NV defects close to the surface created by ion implantation or during chemical vapor deposition growth technique and in nanodiamonds point to a scenario where defects are stabilized in the neutral charge state and that the minority of negatively charged state defects have poor spin properties, i.e. shorter coherence times compared to NV defects deeply localized in bulk diamond. This undesirable behavior appears to result from the interaction with rapidly fluctuating electric fields created by moving charges at the surface and with interface effects associated with the termination of the diamond surface. Here we report studies of photoluminescence and magnetic resonance properties of shallow NV ensembles created by low energy nitrogen ion implantation in electronic grade diamond substrate and nanodiamonds with low nitrogen concentration. We verified the shallow NV center spin properties through pulsed optically detected magnetic resonance (ODMR) protocols and found longitudinal time constant (T1) of a few milliseconds and transversal relaxation time constant (T2) of a few microseconds for shallow defects implanted in bulk diamond. For nanodiamonds, the T2 coherence time is similar to the case in bulk sample but on the other hand the T1 coherence time is ten times shorter than in bulk. Additionally was found that T2* is around one microsecond for shallow NV defects in bulk samples meanwhile in nanodiamonds it is around twenty nanoseconds. It worth to mention that all the measurements were performed in NV ensembles which show just two ODMR resonance lines with applied magnetic field as if they were magnetically equivalent. In that sense we are trying to apply chirped pulses and Ramsey pulse sequence to check this assumption. Finally, we intend to do a comparative study of the spin properties and photoluminescence characteristics which are expected to be influenced by local strains at the near-surface NV centers in order to provide a clearer picture about the origin of the spin decoherence in nanodiamonds.