Surface Impurity Affected Electron Spin Dynamics in GaAs Probed by Optical Pump-probe Scanning Tunneling Microscopy

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Here we present a novel Optical Pump-probe Scanning Tunneling Microscopy[1] (OPP-STM) technique, to investigate electron spin dynamics influenced by deposited Manganese (Mn) adatoms on an in-situ cleaved GaAs (110) surface at nanoscale. As shown in figure 1, we have observed a "surface impurity mediated", nonlinear behavior of electron spin lifetime with respect to Mn amount at room temperature. Details of OPP-STM system, as well as some other results will be introduced in presentation.

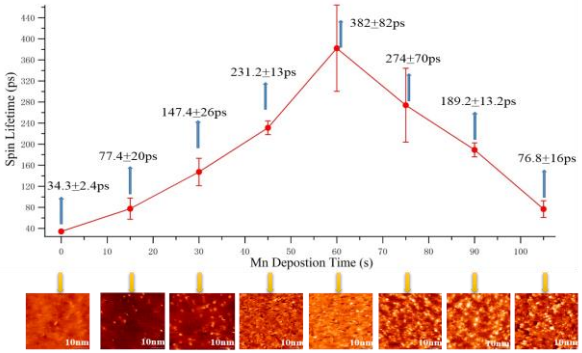

Figure 1. Electron spin lifetime of Mn-deposited GaAs (110) with increasing Mn amount.

References:

1). S. Yoshida, et al. *Nature Nanotechnology 9,* 588-593, 2014.