This conversion factor is determined to be ≈ 0.2 for small scanning areas.

In magnetic fields above the lower critical field, type-II superconductors like $NbSe_2$ enter the

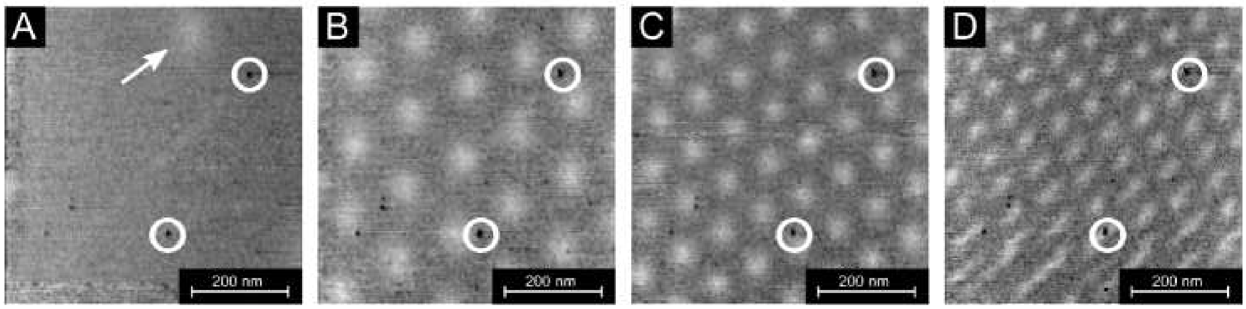

FIG. 8: Measurements of the vortex lattice in $NbSe_2$, with $V = 1.6\,\mathrm{meV}$ and $I = 2\,\mathrm{nA}$ at $T \approx 100\,\mathrm{mK}$ for different fields $B = 0$ (A), $B = 0.2\,\mathrm{T}$ (B), $B = 0.4\,\mathrm{T}$ (C) and $B = 0.8\,\mathrm{T}$ (D). The bright spot in figure A (arrow) shows a trapped flux line. The circles mark surface defects. They do not change the position with increasing field indicating that no major drift is observable.

Shubnikov phase and magnetic flux can penetrate the sample in the form of quantized flux lines, regions where the superfluid density vanishes, i. e., regions with a normal conducting core. These flux lines are regularly arranged (Abrikosov lattice) in superconductors with low pinning and the change of the electronic structure between the superconductive to the normal-conductive density of states is directly observable with STM measurements. To observe the flux-line lattice of $NbSe_2$ a small magnetic field of ≤ 1 T has been applied. Field-dependent measurements of the local density of states in the constant current mode were performed at applied voltage $V \approx 1.6\,\mathrm{mV}$. At this voltage the maximum of the coherence peak is observed in the tunneling spectra in zero field (see fig. 10) and the maximal contrast between normal and superconducting regions is obtained.

In figure 8, four STM images of the same surface region acquired in the constant current mode at $V \approx 1.6\,\mathrm{mV}$ and $T \approx 100\,\mathrm{mK}$ are shown for different applied magnetic fields. The image (A) is measured at zero field, but after a field sweep. A trapped flux line in the upper right-hand corner can be identified (arrow). Flux can still be present in the sample caused either by a remanent field of the superconducting magnet or by pinning of a flux line at a defect. Image (B) is taken at a magnetic field of $B = 200\,\mathrm{mT}$, the expected hexagonal structure of the Abrikosov lattice is clearly observed. Raising the magnetic field (C and D)