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Testing Report of the EBSD detector at the LV SEM (Hitachi S-3500SE) with INCA Programme

EBSD detector testing at the LV SEM is designed by using a pure aluminium sample, and the same EBSD scanned region is also carried out at the Hitachi FEG SEM. The EBSD mapping from the new detector would then be compared with that from the FEG SEM which uses a well established TSL EBSD programme, to confirm the new detector and INCA EBSD programmer validities.
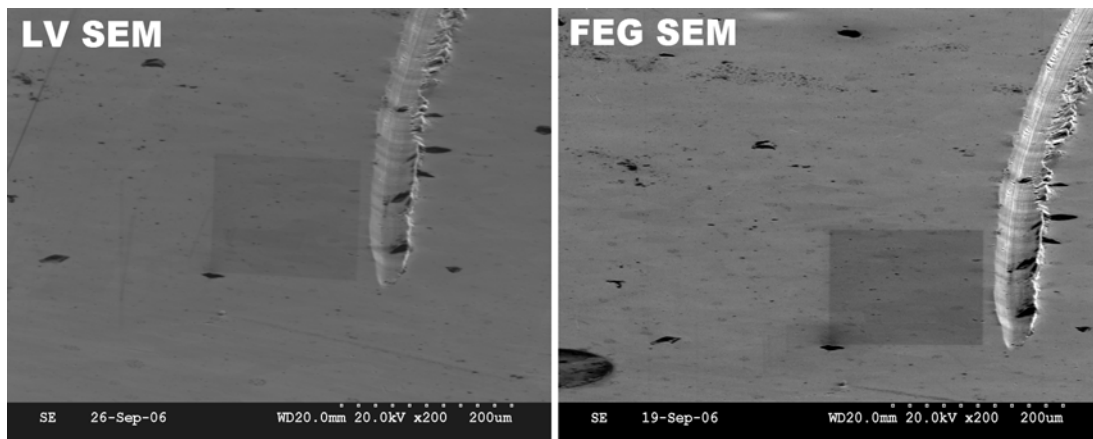

The same EBSD scanned region from the LV SEM and FEG SEM is shown in the above figure, with the SEM condition of HT 20kV, WD 20.0mm, Mag 200 x and 70 tilting angle.

Two basic INCA calibrations for the EBSD patterns were carried out for optimizing EBSD pattern mapping. Below figure shows the Al EBSD patterns before and after background subtraction.
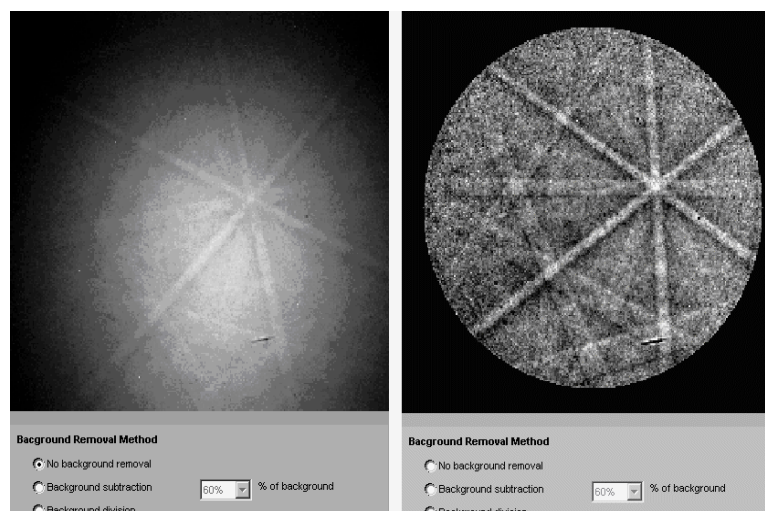
Refinement calibration is performed to calculate the pattern centre information and the sample to the detector screen distance. After the refinement calibration, the EBSD pattern is well indexed from the Hough transformation as show in below figure.
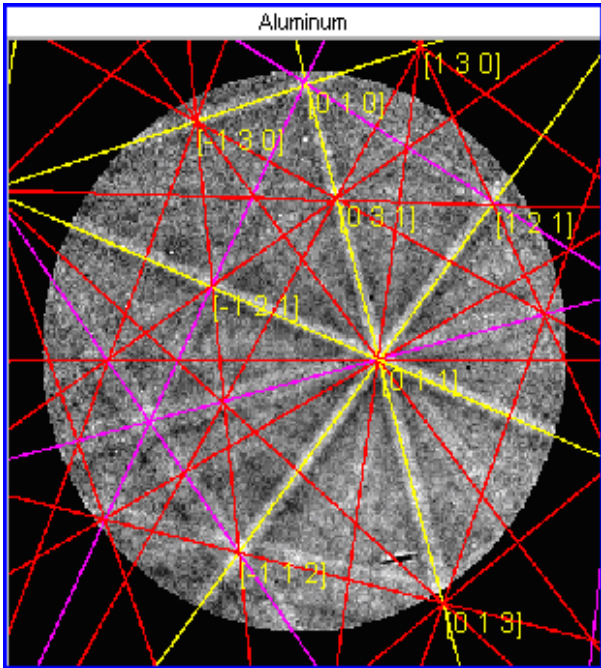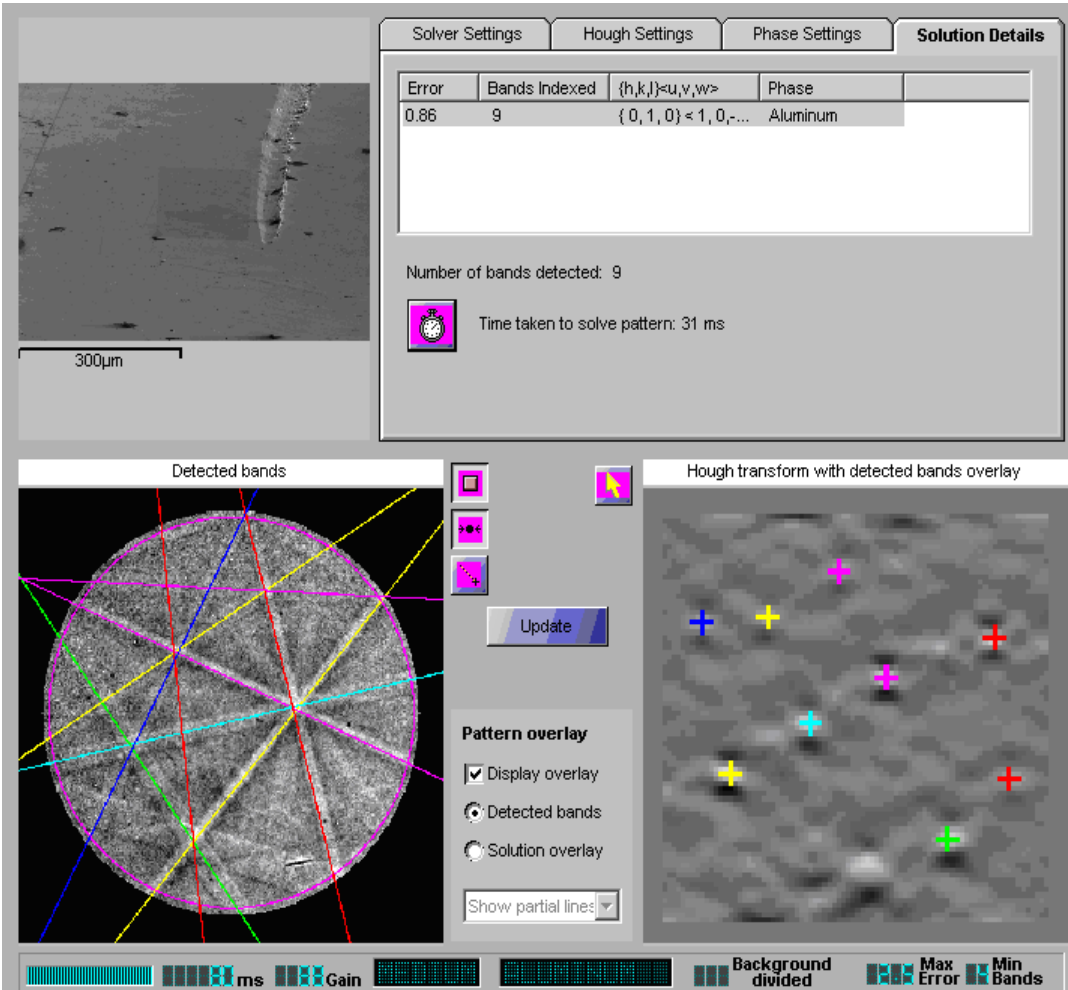

The EBSD pattern is then indexed by Aluminium phase, as shown in the left figure with the Al EBSD indexed pattern overlay.

However at the LV SEM, the further EBSD mapping from the designed area could not be carried out due to the INCA PC memory trouble, as shown in the below figure.
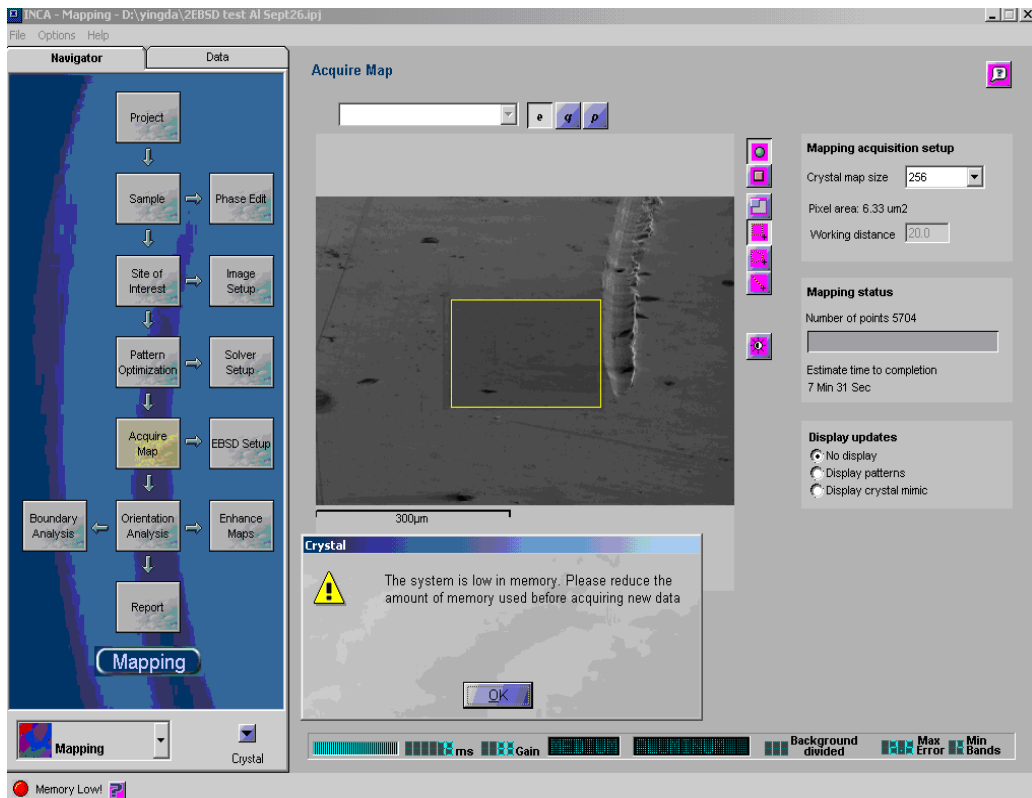
The system is low in Memory and stops the Acquire Map! As checked INCA manual, it needs at least another 100MB (for paging) memory. Now, the INCA Oxford PC has setup at the maximum virtual memory as shown below figure, where the CPU Usage is always as 100% as INCA running. Also as confirmed by Wilhelm at the present virtual memory setting, the HDD status lamp is always ON, which suggested the HDD virtual memory makes the whole progress so slowdown and it has no way to further increase the virtual memory! The solution could be either insert more memory chips (quite limited for this old PC) or replace with a new PC.
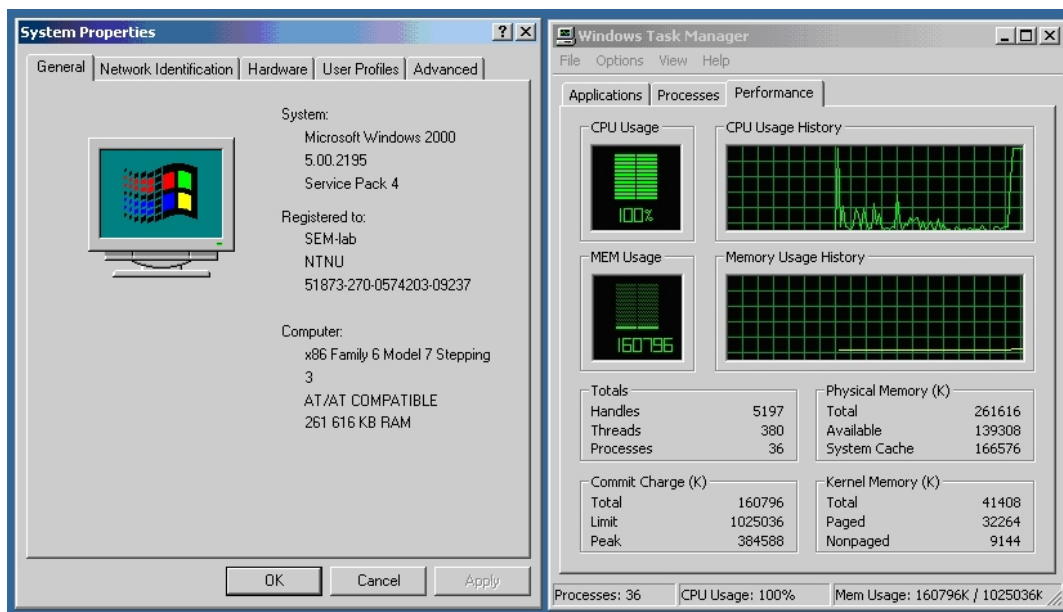
Acknowledgments

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