

DIRECT ACQUISITION OF BACKSCATTERED ELECTRON AND X-RAY IMAGES FOR IMAGE ANALYSIS FROM AN ELECTRON MICROPROBE

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Modern electron microprobes, and also many scanning electron microscopes, are microprocess or controlled and generally incorporate the capability for digital beam scanning and video digitisation. In addition, because they are controlled by multi-user, multi-tasking operating systems, the host computers used to control them, have sufficient capacity to allow them to perform image display acquisition and analysis provided the necessary hardware and software are added to the system.

To be useful in such applications the image acquisition system should be capable of directly digitising signals and of controlling the electron microprobe stage with the ability to measure the required electron probe operating parameters. In addition, apart from the actual image acquisition phase itself, the system should impose minimal restrictions on the normal functions of the instrument for quantitative and qualitative chemical analysis.

The CSIRO Division of Mineralogy and Geochemistry is currently developing these capabilities on its Cameca electron probe to provide a powerful method of aiding the petrologist and mineralogist in their assessment of geological samples. The aims are to (1) provide a substantial increase in information content through combination of point chemical analysis with quantitative stereological and morphological data and (2) provide facilities for automated search procedures in an unattended mode to reduce the operator time in the investigation of specific problems.

The system being developed has required the addition of graphics display controller and a software package for image analysis and, with simple modifications to the existing equipment is expected to provide the required capability at modest cost compared with commercially available image analysers. A description of these modifications, additional equipment and current performance of the system will be given and future developments discussed.