



	Experiment title: Determining the stress field variation around scratches in aluminium alloys	Experiment number: MA-787
Beamline: ID31	Date of experiment: from: 2/4/2009 to: 7/4/2009	Date of report: 28/8/09
Shifts: 15	Local contact(s): Dr Andy Fitch	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): Professor Michael Fitzpatrick* Md. Kashif Khan Linda Degardin* Materials Engineering The Open University Milton Keynes MK7 6AA UK Dr Simon Lawes* University of Leicester		

Report:

In this experiment we intended to complete a previous study on the residual stresses generated around scratches in aluminium alloys. That work had identified high tensile strains at the root of scratches, and that the strain magnitude was highly-dependent on the tool profile. The experiment was designed to obtain the additional strain information needed for the calculation of the full residual stress tensor near the notch tip, and also to investigate the effect of varying the root radius of the tool used to undertake the scratching.

However, towards the end of the beam time, it became clear that there was a significant problem with the instrument. Our results had been somewhat peculiar, and in repeating some data points to obtain a more detailed profile, a very large peak shift was observed. A long scan of a single peak, at a single position in the sample, resulted in the data shown in figure 1, showing a high degree of drift with time. It was not possible to find any periodicity that would allow for correction of the measured data, and unfortunately this was only noticed in the final two shifts.

The cause of this was not discovered, and the experiment will be repeated using time awarded for MA-928. Hence no data from the experiment can be reported.

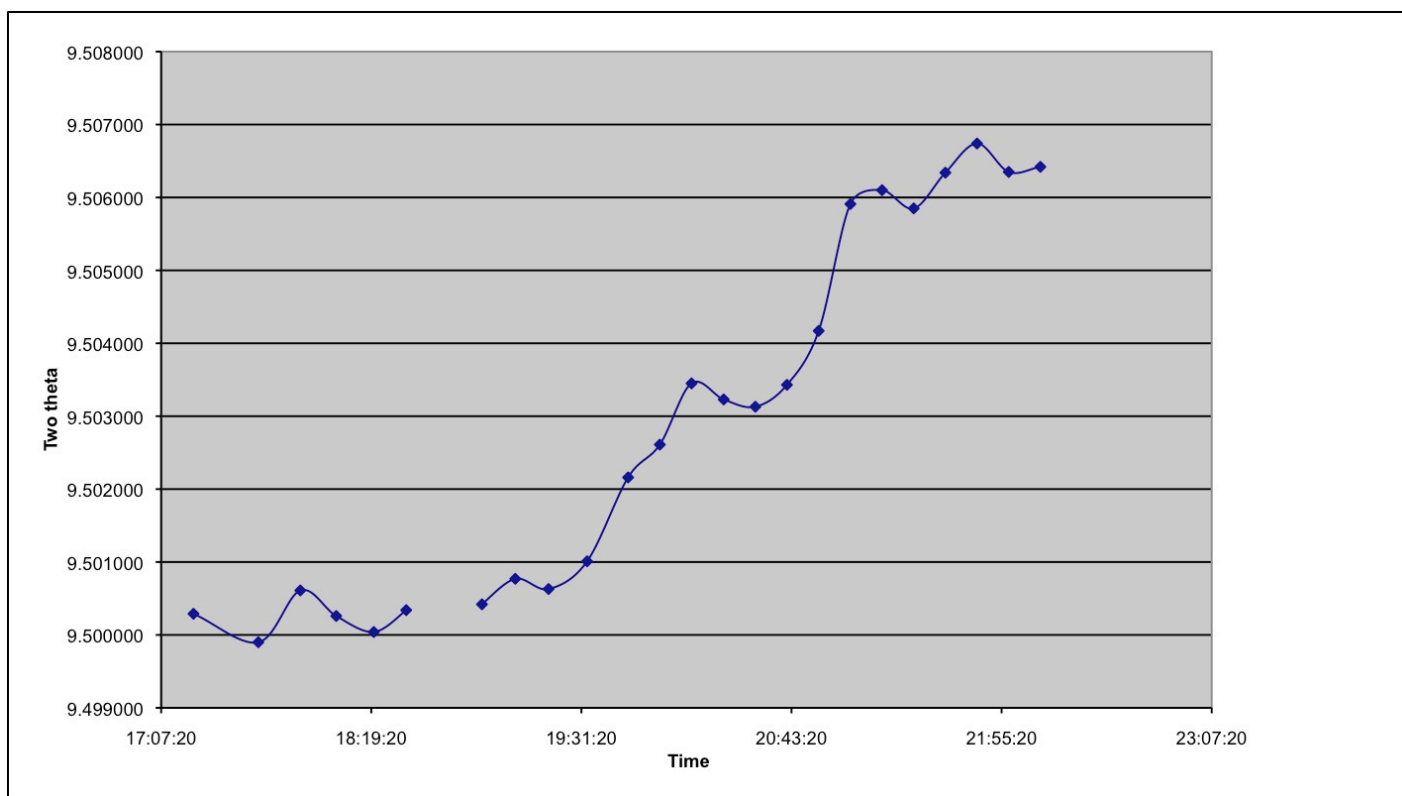


Figure 1: change in position of a single peak with time