



	Experiment title: Critical anomalous scattering from FeCo at glancing angles.	Experiment number: SI-217
Beamline: ID03	Date of experiment: from: 30.9.96 to: 6.10.96	Date of report: 26.2.97
Shifts: 14	Local contact(s): Jesus Alvarez Alonso	<i>Received at ESRF:</i>

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Report:

The binary alloy FeCo undergoes a continuous order-disorder transition from the CsCl-structure to the bee-structure at a critical temperature around $T_C \approx 1000$ K.

This x-ray study was focused onto surface-critical scattering when the bulk of the sample approaches T_C . In order to get access to the surface order we performed detailed measurements of the asymptotic (20L) Bragg rod between $L=0.90$ and $L=1.1$ at various temperatures. Fig. 1 shows by way of example a typical result as obtained for $T=T_C-40$ K. The Gaussian is related to the bulk order which can be used to monitor the bulk critical behaviour. Interestingly, an additional broad scattering feature is observed (dashed curve) which gives direct indication of a modified surface order. Note here that the observed scattering is mediated by the weak one-electron-contrast between Fe and Co. The observation of this weak surface scattering requires the high brilliance of the ESRF.