



	Experiment title: 3D – Electron Momentum Density of Graphite : Anisotropies and Many-body Effects	Experiment number: HE-568
Beamline: ID15a	Date of experiment: from: 10.04.1999 to: 17.04.1999	Date of report: 09.08.1999
Shifts: 18	Local contact(s): Veijo Honkimäki	<i>Received at ESRF:</i>
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Report:

As indicated in the application for this beamtime it was intended to use for the first time the new 13 element Ge-diode as a photon detector in combination with the existing setup for ($\gamma, e\gamma$) experiments. In order to allow a multi parameter coincidence between the 256 pixel electron detector and the 13 pixel photon detector the corresponding electronics had to be modified and re-installed. This became necessary in order to upgrade from the former single photon channel to 13 channels. This hardware modification had been finished well in advance to the allocated beamtime slot.

However, no extensive assessment of the whole setup was made until the beginning of the experiment. Tests of the coincidence electronics by the manufacturer had been performed only with random signals in a limited number of channels. When starting the experiment it turned out that this procedure was not sufficient : Whenever two electron signals were detected within a certain time window on the same channel card, which treats the signals

of 16 electron detector pixels, the coincidence electronics ran into an undefined state until the module was automatically reset. Consequently, the device was basically hung up for about 95% of the time. Although the manufacturer was immediately informed about the failure and it was tried to solve the problem, the cause for this behavior could not be found until the end of the allocated beamtime. A provisional arrangement was found towards the last shifts allowing to measure coincidences for about 24 hours. It could be verified that the total coincidence rate increased by a factor of 7 – 8 compared to the former setup with only one photon channel. That this factor is less than 13 is well understood from the finite extension of the electron detector and fits well with our estimations. Dead time of the arrangement is still at an acceptable value.

The software control of the data acquisition and coincidence electronics, which runs via SPEC on customized VME electronics, had to be modified for the new 13 element setup. This was started only few days before the allocated beamtime. It was only then found that VME electronics had to be exchanged and the modifications made extensive debugging necessary. The data acquisition was finally running after 4 shifts of allocated beamtime.

As a consequence of the encountered difficulties the experiment could not be carried out as proposed. The verification of the strongly increased coincidence count rate during the last hours is, on the other hand, very encouraging and the new setup for $(\gamma, e\gamma)$ experiments with the 256 pixel electron and 13 pixel photon detectors is very promising.