ESRF	**Experiment title:** Study of metal-insulator transition A4C60 by Compton scattering under pressure	**Experiment number:** HS1221
Beamline: ID15B	**Date of experiment:** from: 07.04.00 to: 17.04.00	**Date of report:** 25.07.00
Shifts: 24	**Local contact(s):** Thomas BUSLAPS	*Received at ESRF:*

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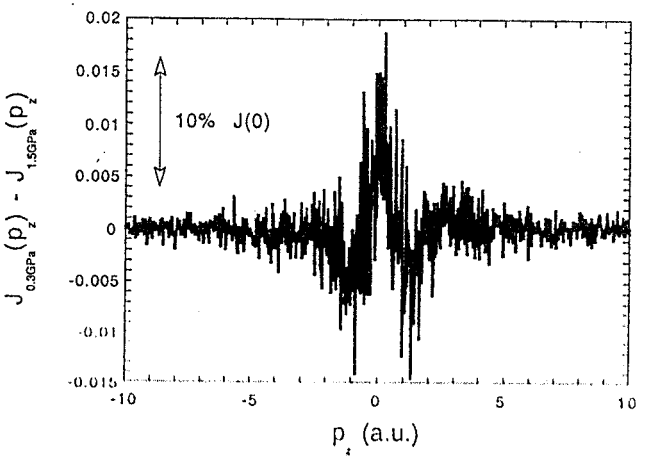
Report:

The experiment has been performed using backscattered photons in order to obtain the Compton profile. The insulator-metal phase transition is close to 0.8 Gpa. Compton profiles were measured by the way of a Ge-detector. The photons delivered by the synchrotron were monochromatized at the energy of 60 keV. Two Compton profiles have been measured : the first measurement has been perfored at ambient pressure and the second at the pressure of 1.8 GPA. The pressure was followed by diffraction experiment in order to be able to control the input pressure on the sample. Through this diffraction experiment, we conclude that no structural change occured : it means the only effect of pressure is the modification of the electronic structure. This fact enhance the interest of such Compton profile experiment.



As shown in the figure above, the Compton profile measured at low pressure is higher at low momenta than the profile measured at high pressure. It means that the electronic density is more localized in momentum space in the case of the measurement preformed at low pressure, i.e. more delocalized in charge space than the electronic density of Rb_4C_{60} at pressure higher than the insulator-metal transition. This result was expected. Nevertheless, the surprise comes from the amplitude of the observed effect on the difference between both low-pressure and high pressure measured profiles. This experimental difference remains to be compared to the calculations to be performed by M. Fabrizio and E. Tosatti (SISSA, Trieste, Italy) before any conclusion about the Jahn-Teller distorsion effect invoked to be responsible of the insulating phase of compounds like Rb_4C_{60} or K_4C_{60}.