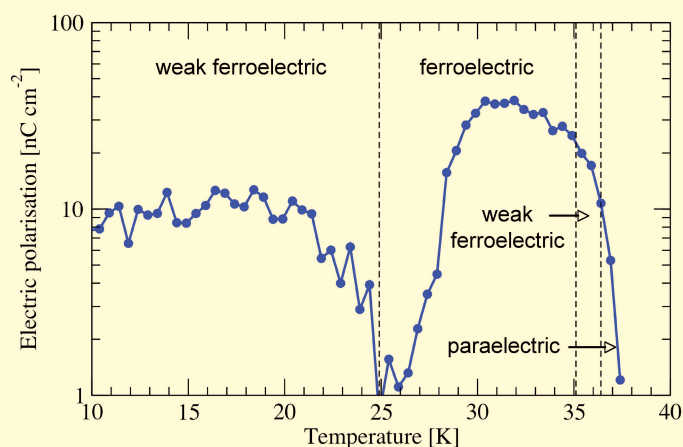


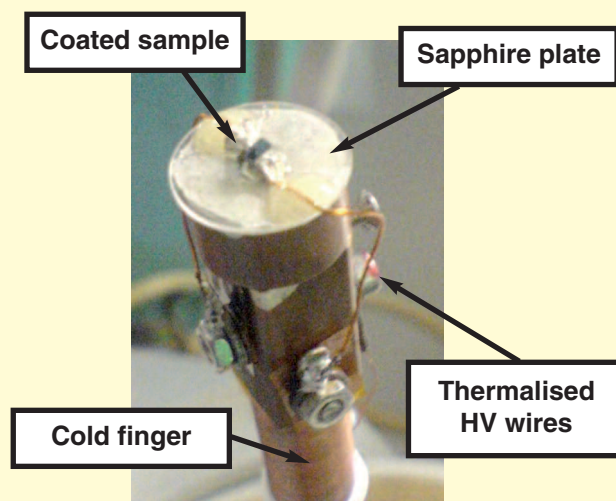
## In-situ P-E measurements now available !

XMaS is offering a new facility allowing electric polarisation (P-E loop) measurements with and without x-rays. The first user experiment took place in July, investigating the possible link between magneto-electric coupling and magneto-striction in the multiferroic  $\text{TmMn}_2\text{O}_5$ . The diffraction data and P-E loops were recorded



**Fig. 1:** Temperature dependence of the electric polarisation of  $\text{TmMn}_2\text{O}_5$  showing the ferroelectric phases as measured in [1]. Courtesy of R. Johnson, S. Bland and P. Hatton (Durham Physics Department)

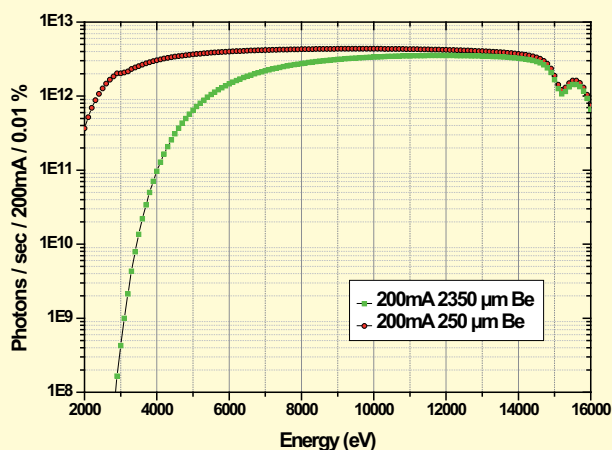
simultaneously. The electric polarisation measured as a function of temperature (**Fig. 1**) shows good agreement with published results [1]. Currently XMaS offers an electric field sample environment (**Fig. 2**) of  $\pm 2$  kV with temperatures down to 2 K in a 4 T magnetic field. A separate sample environment provides  $\pm 10$  kV down to 10 K in a 1 T field.



**Fig. 2:** Sample gold coated on two sides and mounted on a sapphire plate for electric isolation. The two HV wires soldered on the gold are connected to the cryostat.

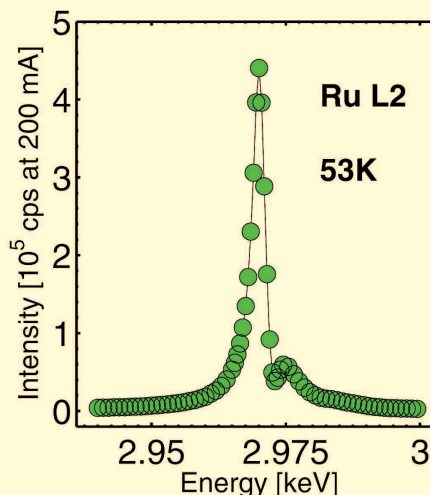
## XMaS becoming softer !

A few modifications of the beamline components (thinner front end Be window etc...) took place early this year to increase the available flux below 3 keV by several orders of magnitude (**Fig. 3**). A recent test experiment on  $\text{Ca}_3\text{Ru}_2\text{O}_7$  at the Ru  $L_2$  edge (**Fig. 4**) demonstrated that studies of 4d systems



**Fig. 3:** Comparison of the current flux available with 2350  $\mu\text{m}$  of beryllium to that of only 250  $\mu\text{m}$  (now).

are possible at XMaS. The sample environment was windowless and incorporated into the beamline vacuum system. Presently, the lowest accessible energy at XMaS is 2.40 keV. Next winter, the installation of a new (liquid-nitrogen cooling) monochromator will allow access to energies down to 2.04 keV.



**Fig. 4:** Energy dependence of the (001) magnetic reflection of  $\text{Ca}_3\text{Ru}_2\text{O}_7$  measured across the Ru  $L_2$  edge at XMaS. The resonance line shape is comparable to that reported in [2].