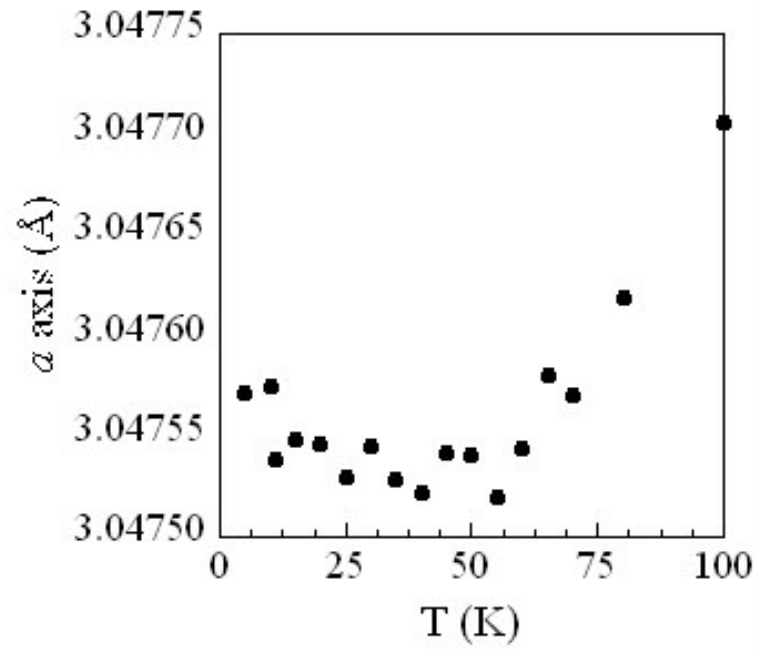
	<b>Experiment title:</b> Negative thermal expansion in the new superconducting Sc doped MgB <sub>2</sub>	<b>Experiment number:</b> HS-2729
<b>Beamline:</b> ID31	<b>Date of experiment:</b> from: 20-June-2005                      to: 21-June-2005	<b>Date of report:</b> 1-August-2006
<b>Shifts:</b> 3	<b>Local contact(s):</b> Michela BRUNELLI	<i>Received at ESRF:</i>
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**Report:**

In continuation of the experiment performed during 18/22-April-2005, we have focused our attention on the study of the thermal expansion of the  $\text{Mg}_{0.55}\text{Al}_{0.45}^{10}\text{B}_2$  system. The measurements were made at 21 different temperatures in the range between 5 K and 300 K. In Figure 1 we report the variation of the  $a$  axis for the studied sample. The results for the  $a$ -axis shows a small negative thermal expansion below  $T^*=50$  K while the  $c$ -axis show a standard dependence on the temperature.

Although all these results are still under investigations the evidenced negative thermal expansion provide an experimental feed-back for the theoretical models focussing on the role of electronic and lattice degrees of freedom in the superconductivity of the diborides in the proximity to a lattice instability near a electronic topological transition.



**Figure 1:** Evolution of the  $a$  axis of the  $\text{Mg}_{0.55}\text{Al}_{0.45}\text{B}_2$  system as a function of the temperature.