



	Experiment title: Pressure induced disappearance of the local rhombohedral distortion in BaTiO ₃	Experiment number: HS-3132
Beamline: ID9a	Date of experiment: from: 17-feb-07 to: 20-feb-07	Date of report: 16-aug-07
Shifts: 9	Local contact(s): Michael HANFLAND	<i>Received at ESRF:</i>

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Report:

The results of this experiment will appear in Phys. Rev. Lett. The paper is expected to be published in the September 7, 2007 issue with the title :

“High-pressure study of X-ray diffuse scattering in ferroelectric perovskites”
by Sylvain Ravy, Jean-Paul Itié, Alain Polian and Michael Hanfland

The text is also available at <http://fr.arxiv.org/abs/0707.4095>

Abstract of the paper:

We present a high-pressure x-ray diffuse scattering study of the ABO₃ ferroelectric perovskites BaTiO₃ and KNbO₃. The well-known diffuse lines are observed in all the phases studied. In KNbO₃, we show that the lines are present up to 21.8 GPa, with constant width and a slightly decreasing intensity. At variance, the intensity of the diffuse lines observed in the cubic phase of BaTiO₃ linearly decreases to zero at ~11 GPa. These results are discussed with respect to x-ray absorption measurements, which leads to the conclusion that the diffuse lines are only observed when the B atom is off the center of the oxygen tetrahedron. The role of such disorder on the ferroelectric instability of perovskites is discussed.