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Soft mode dispersion and ‘waterfall’ phenomenon in relaxors revisited

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Notes

Notes

1. In the present work, the c axis is defined by the direction of the c^* vector expressed in the reciprocal space, i.e. c^* . The c axis length is $c = 4.04 \text{ \AA}$.
2. For the present work, the c axis is defined by the direction of the c^* vector expressed in the reciprocal space, i.e. c^* .
3. Apart from the c axis, the a and b axes are defined by the trigonometric function $\sin(\theta)$ and $\cos(\theta)$ respectively.
4. This work is part of the project "Phonon dispersions in the GHz region, c" funded by the European Commission under the 6th Framework Programme through the Key Action: Strengthening the European Research Area, Research Infrastructures. Contract No.: RII3-CT-2003-505925. Additional financial support was obtained from the Czech grant agencies (projects GACR 202/06/0403 and GACR 202/06/0411 and AVOZ 10100520). Authors thank to Dr S. Gvasaliya from Laboratory for Neutron Scattering of ETH Zurich and Paul Scherrer Institut in Villigen for useful discussions and the help with set-up of the experiment at TASP instrument, to Dr J. Petzelt from the Institute of Physics of Czech Academy of Science in Prague for careful reading of the manuscript and to Dr J. Kulda from the Institute Laue-Langevin for his long-term interest, encouragement, valuable suggestions and numerous critical discussions.



5. We have combined the data from the (200) and (300) BZs as D_q should be independent of the BZ choice.
6. In principle, PMN is known to grow also, for example in pyrochlore structure, but in this case both the lattice parameters and the TO mode frequency are completely different.
7. It was argued in [9](#) that the TO mode cannot couple noticeably to the TA branch because the independent mode intensities do not change with temperature. However, this not a valid argument since the measurements shown in figure of Ref. [9](#) were done in (20q) zone, where both TA and TO modes have similar structure factors so that eventual eigenvector change has no chance to produce such drastic intensity changes as those observed in the quoted [9](#) case of SrTiO_3 .

Related Research Data

[Relaxing with relaxors: a review of relaxor ferroelectrics](#)

Source: Informa UK Limited

[Soft phonon columns on the edge of the Brillouin zone in the relaxor \$\text{PbMg}_{1/3}\text{Nb}_{2/3}\text{O}_3\$](#)

Source: American Physical Society (APS)

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