Supplementary materials

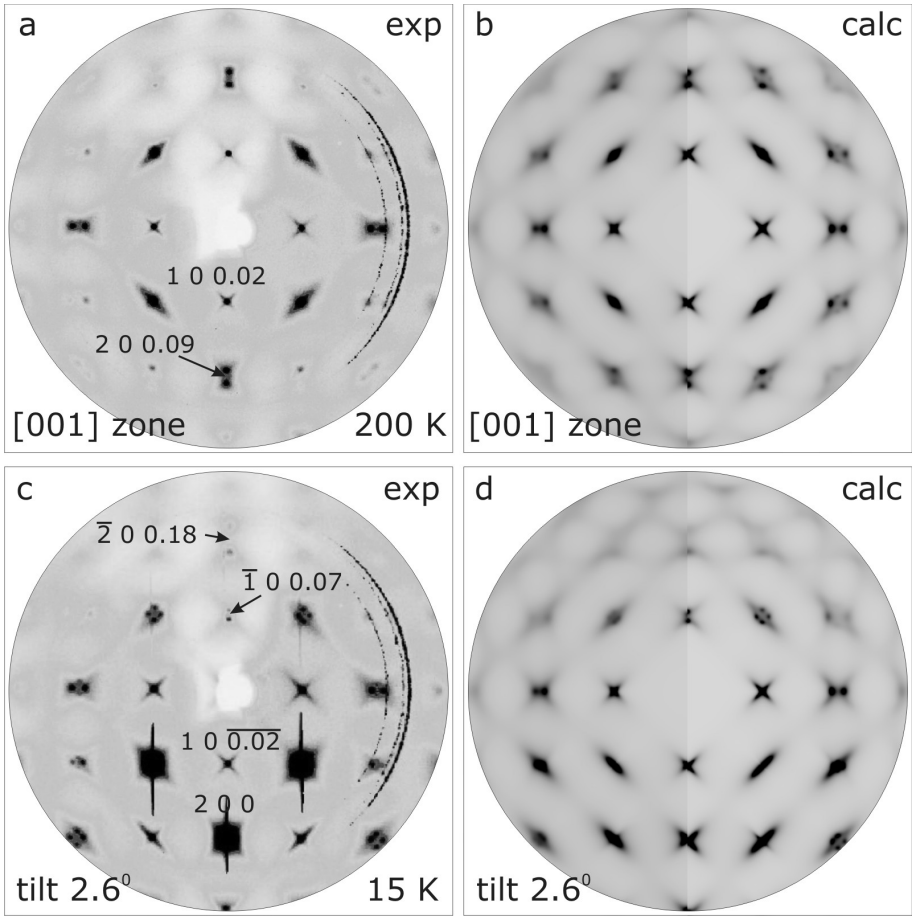

Fig. S1. (a), (c) Still images of Xu, Zhong *et al.* (2004) for PZN-PT compared with the proposed model (b), (d). Experimental parameters, when reported, were retrieved from the publication. The left half of the model patterns uses the same parameters as chosen for the PMN-PT description, the right half uses Ψ_{12} increased by 20%. A constant background is added to facilitate the comparison.

Fig. S1 provides an illustration of the fact that raw images, taken for PZN-PT by Xu, Zhong *et al.* (2004), can be perfectly rationalized within the frame of our parameterization without introducing any PNR entities. Note that when 200, 110 and 1-10 spots appear on the Ewald's sphere (Fig. S1c), their shape is not adequately recorded by the CCD detector due to an overexposure.

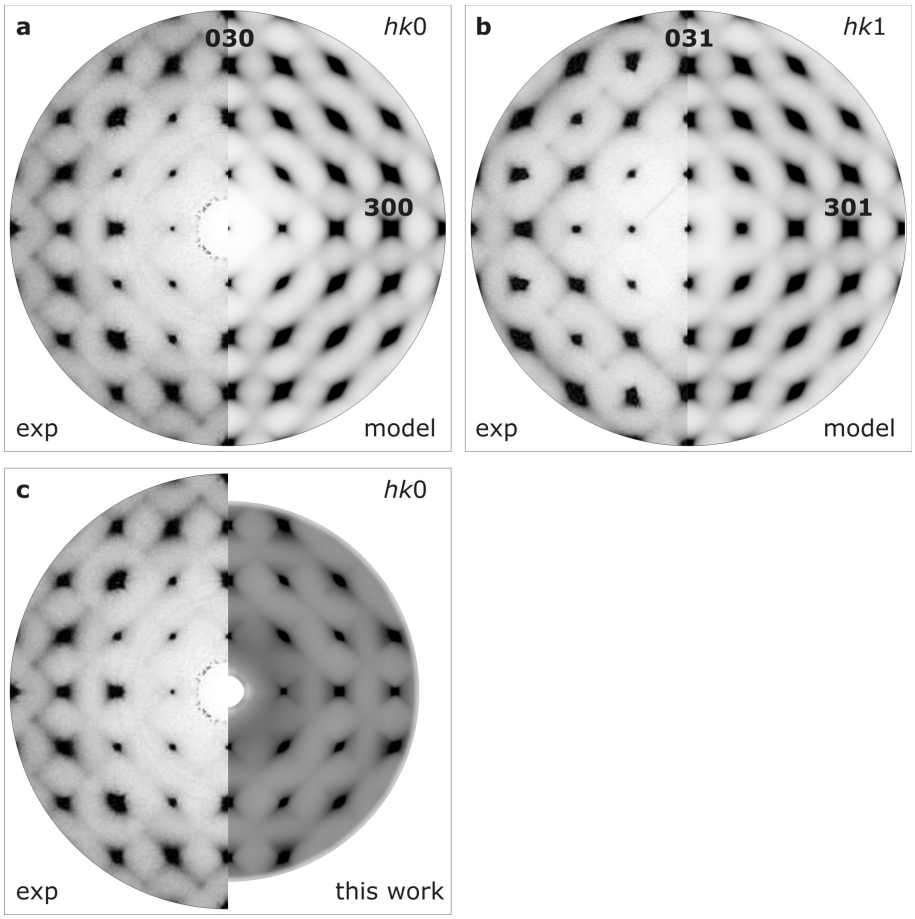

Fig. S2. Comparizon of Laue time-of-flight neutron scattering data reported by Welberry (2008) for PZN with: (a), (b) proposed model, (c) x-ray scattering data. The integration was performed over ±0.2 r.l.u.; a step of 0.025 r.l.u. was used for the modelling. The model uses the same parameters as chosen for the PMN-PT description, but the atomic scattering factor for Pb was kept constant.

Fig. S2 illustrates that the Laue time-of-flight patterns reported by Welberry (2008) can be partially rationalized in the frame of the same model we use for our data. The qualitative changes of contrast compared to our experimental data can be reproduced by integrating the diffuse scattering along the zone axis [001] both for our experimental data and for our model. We were not able to find any details concerning the issue of integration layer thickness in (Welberry, 2008) and related papers, but good optical match condition imposes the integration layer thickness being in the range of 0.3-0.4 r.l.u. Thus, it is not surprising that a number of essential features were lost and could not serve as an input for Monte-Carlo modelling (Welberry & Goossens, 2008, Welberry, 2008).

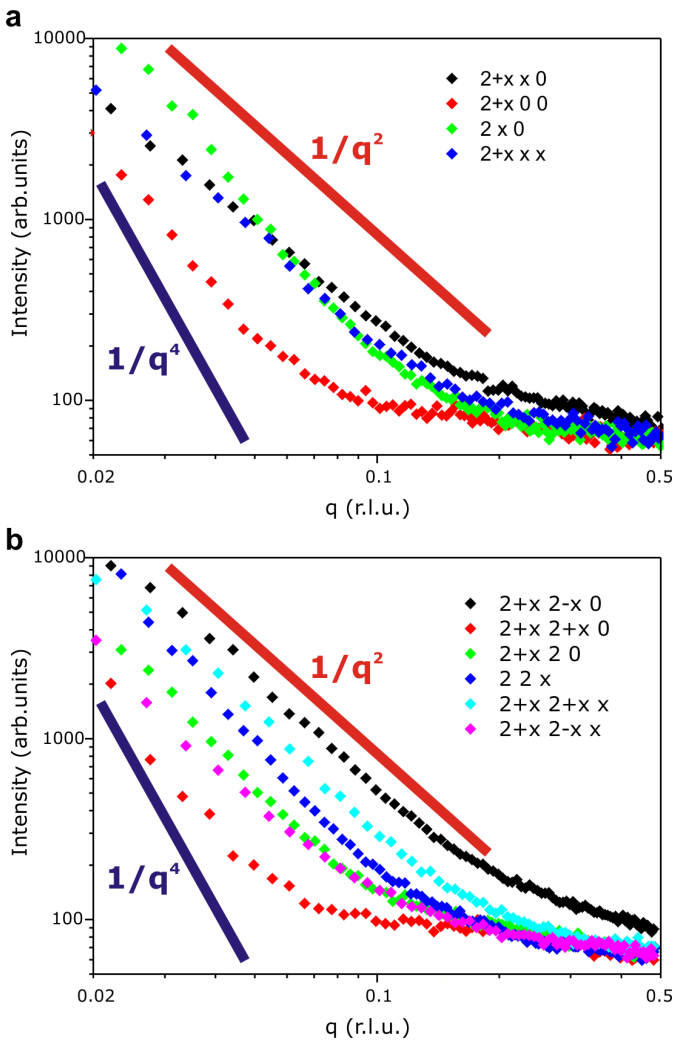

Fig. S3. Experimental dependence of diffuse intensity in PMN-PT traced for a selection of directions in the proximity of (a) (200) and (b) (220) Bragg nodes. Data are represented on a double logarithmic scale; q^{-2} and q^{-4} dependencies serve as a guide to the eye.

References

Welberry, T.R. & Goossens, D.J. (2008). *Acta Cryst.* A**64**, 23-32.

Welberry, T.R. (2008). *Metallurgical and Materials Transactions A* **39**, 3170-3178.

Xu, G., Zhong, Z., Hiraka H. & Shirane, G. (2004). *Phys. Rev. B* **70**, 174109-1-10.