Polar Nano-Regions in Ferroelectric Relaxors

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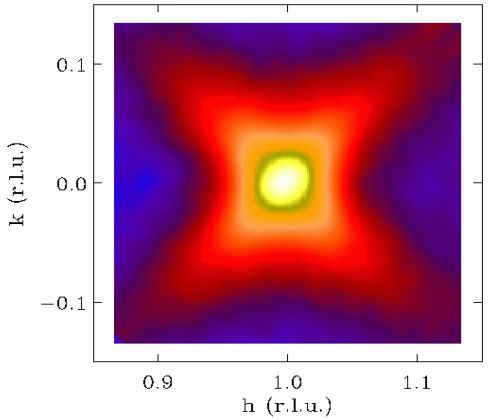
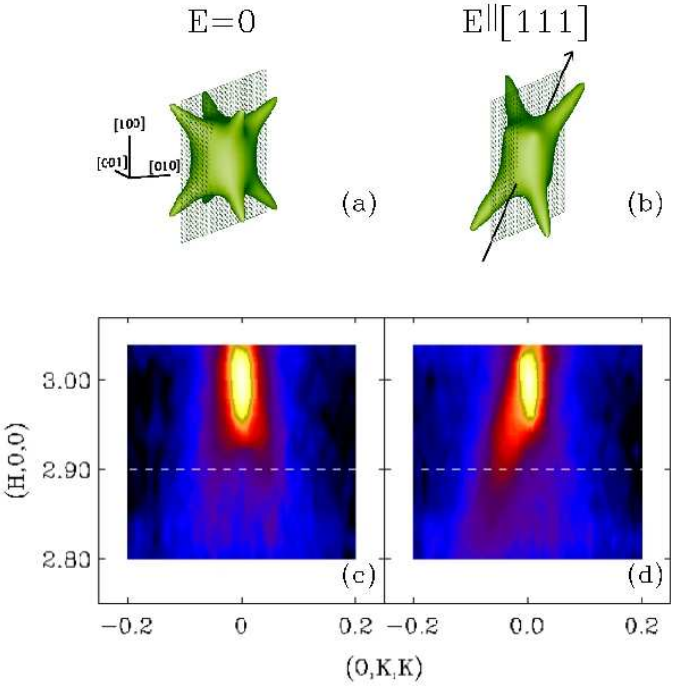
PMN T=200K

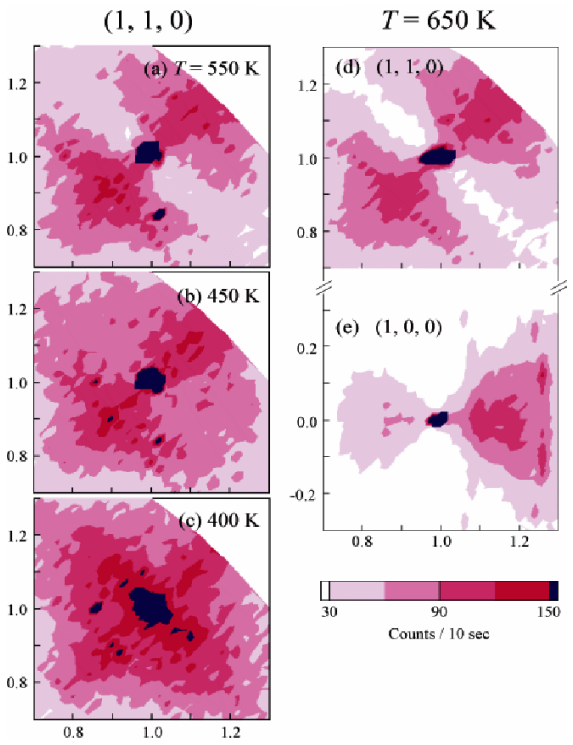


- **PZN-xPT and PMN-xPT: Ferroelectric Relaxors**
- **Polar nano-regions (PNR): Unique for relaxors. Appearing at T_d (~600K), a few hundred degrees above T_C.**
- **The PNR can be probed directly by diffuse scattering measurements, to obtain information on the size, shape, and polarizations.**

PZN-8%PT T=300K



PMN



Effects of external electric field - does it remove the PNR?

- **Does not induce macroscopic uniform ferroelectric phase as one would naively believe.**
- **Diffuse scattering is partially enhanced.**
- **PNR still exist, as "out-of-phased" islands in the ferroelectric environment.**

- **Diffuse scattering found above T_d**
- **High temperature diffuse (HTC) has conjugate shapes with the low temperature diffuse**
- **Lattice modulations due to short range chemical order – may be the building blocks of the PNR.**