# X-RAY COMBINED ANALYSIS OF TEXTURED CERAMICS OF MORPHOTROPIC PHASE BOUNDARY $Pb(Mg_{1/3}Nb_{2/3})O_3$-$PbTiO_3$

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Texturing of ceramics with compositions in the morphotropic phase boundary (MPB) region of solid solutions such as $Pb(Mg_{1/3}Nb_{2/3})O_3$-$PbTiO_3$ (PMN-PT) has attracted a great deal of attention in recent years due to the interest of obtaining piezoelectric coefficients comparable to those of single crystals [1]. The degree of preferential orientation achieved is usually evaluated by the Lotgering factor, which, in fact, only provides a rough estimation that can be misleading in some cases [2]. More information can be obtained by fitting rocking curves to the March-Dollase equation [3], but it is still partial, referred to specific crystallographic directions. Moreover, the coexistence of different polymorph phases for compositions close to the MPB makes texture determinations even more complex.

In order to obtain quantitative and global textural information in these ceramics, a combined analysis of the X ray diffraction pole figures has been used [4]. Both the orientation distribution function and the structural parameters have been determined for ⟨001⟩-textured ceramics of MPB PMN-PT, processed by Templated Grain Growth of nanocrystalline powder with the use of cubic templates [5]. The combination of advanced methods of analysis, the quantitative texture analysis and the Rietveld method, allows access to information on the different components of the global texture and to more accurate values of structural parameters, which are very relevant to understand the behavior of these compositions at the MPB. The results obtained are compared with those that result of the use of more conventional methods of analysis of X ray data, and the feasibility of the application of the combined method to similar problems is discussed.

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