

QUANTITATIVE ANALYSIS OF PREFERENTIAL ORIENTATION  
COMPONENTS OF FERROELECTRIC THIN FILMS

J. Ricote, D. Chateigner  
LPEC, Université du Maine-Le Mans  
BP 535, 72085 Le Mans, FRANCE

L. Pardo, M. Algueró<sup>‡</sup>, J. Mendiola, M.L. Calzada  
Instituto de Ciencia de Materiales de Madrid, CSIC  
28049 Madrid, SPAIN

<sup>‡</sup> Present address: Dept. of Materials, Queen Mary and Westfield College, University of  
London, London E1 4NS, UNITED KINGDOM

It is well-known that the presence of any preferred crystallographic orientation, or texture, is a determinant factor of the behaviour of ferroelectric thin films. Much attention has been given to the growth of thin films in order to achieve the desired orientations, but these studies have been focused mainly in the analysis of major X-ray reflections, which only in certain cases are characteristic of a given texture. Despite of this interest, complete quantitative texture analysis, including the measurement of diffraction pole figures with a goniometer and the calculation of orientation distribution functions, has not been carried out extensively in ferroelectric thin films.

In this work, the components of the texture of ferroelectric thin films with compositions La- and Ca-modified lead titanate have been identified as a mixture of  $\langle 100 \rangle$  and the desired  $\langle 001 \rangle$  orientations. The values of the texture strength of the films and the substrate are obtained and compared with the processing parameters and properties of the films, like polarisation or coercive field. Results from other ferroelectric thin films are also presented for the sake of comparison. All this is valuable information to understand the process which leads to the appearance of preferential orientations, which can be used to optimise the preparation methods of ferroelectric thin films in order to obtain improved materials for specific applications.