A SIMPLE APPLICATION OF FUZZY ARITHMETIC TO AUTOMATIZE THE ALIGNMENT OF A CRYSTAL IN CHANNELING EXPERIMENTS*

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in this paper we present some results concerning the application of fuzzy arithmetics to the alignment of the mayor symmetry directions of a single-crystal with the ion beam direction. The goniometer settings for the alignment are calculated from the intersection point of the crystal planes plotted on a polar diagram. These planes are represented as straight lines joining the corresponding points of minimal RBS yields of the azimuthal angle "phi" for different tilts (theta <= 10°). In our apporach, we consider the normalized distribution curves around the minimal RBS yields as fuzzy numbers and we calculate the intersection point of the crystal planes using the concepts of fuzzy subset theory. this technique is proposed as an attempt to automatize the crystal alignment procedure reducing the sensibility of the alignment procedure face to uncertainties and imprecisions associated to the experimental data.