cantilever contacting sample surface allows to calculate the value of contact stiffness, i.e. the value of the elastic constant of the spring representing tip-sample contact in a linear model.

From contact stiffness values, sample local Young modulus value can be calculated. In case of monocrystalline samples (Si, GaAs and InP), the local Young modulus is found to be in good agreement, within the experimental error, with data reported in literature. On the basis of these results, we are investigating the AFAM capability of determining the local Young modulus on nanostructured materials. In particular, we report about the first experimental results regarding hybrid materials containing Single Wall Carbon Nanotubes (SWCN).

[1] Rabe U., Amelio S., Kester E., Scherer V., Hirsekorn S., Arnold W., *Ultrasonics*, 2000, **38**, 430.

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Spatial Maps of Eu-aggregates in NaCl:Eu^{2+} and KCl:KBr:Eu^{2+} Single-crystals

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The spatial distribution of fluorite-type $EuCl_2$ particles precipitated in well-annealed NaCl:Eu^{2+} and KCl:KBr:Eu^{2+} single-crystals, as well as that of isolated Eu^{2+}-cation vacancy dipoles and other first products of aggregation in freshly-quenched KCl:KBr:Eu^{2+} single-crystals, were studied by using three-dimensional physical models built from images of epifluorescence optical microscopy. Laue and rotation patterns and crystal-plate X-ray diffractometry, optical spectroscopy, and powder X-ray diffractometry were used, respectively, to confirm the single-crystal character of the specimens, to monitor the Eu^{2+}-precipitation dynamics during annealing, and to test the disordered substitucional solid-solution character of the mixed alkali-halide crystals under study. For long-annealed NaCl:Eu^{2+} crystals [1], fluorite-type $EuCl_2$ particles smaller than 0.28 μm were found to exist all across the crystal host (4.0×10^{11} precipitates cm^{-3}), while big $EuCl_2$ particles, in the size range from 0.28 to 0.45μ were found to precipitate along certain linear structural singularities (identified as crystal edge dislocations) of the crystalline matrix (1.2×10^{4} precipitates cm^{-1}). These dislocations, of about 10.0μm in length, were found to be periodically arranged, forming wall-like groups of dislocations, along subboundaries between crystal domains. The translational period found for the dislocations in these subboundaries corresponds to a domain misorientation of about 0.9". Europium-exhaustive matrix zones were observed to accompany the decorated dislocations, indicating that impurity segregation processes are involved during secondary-phase precipitation. For long annealed KCl:KBr:Eu^{2+} crystals, more complicated networks of $EuCl_2$-decorated subboundaries were found to exist within the mixed crystalline matrix. These subboundaries were observed to be similar in their microscopic appearance to the macroscopic overall shapes of typical vitreous conchoidal fractures.

[1] Cordero-Borboa A.E., Jiménez-García L.F., *Phil. Mag. Lett*., 2003, **83**, 4, 241.

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