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S E M I N A R

aus

Halbleiterphysik und Nanotechnologie

Di, 17.5.2011, 11 Uhr c.t.
Hörsaal für Physik

"The matrix method - an overdue paradigm shift in x-ray and neutron stress measurement"

Balder Ortner, ao Univ. Prof. i. R.
Leoben

The $\sin^2\psi$ method has been used for more than half a century with great success. Nevertheless, it has also its shortcomings. One of it is the fact that it does not perfectly model the physical basis of the problems, thus producing results which are not as accurate as they could be. Usually, this has been simply ignored. The second weak point is that for many stress measurement problems the $\sin^2\psi$ method is not applicable. A great number of different methods have been invented in attempts to overcome the second disadvantage of the $\sin^2\psi$ method, with rather limited success. A simple and most effective solution of all the above mentioned difficulties is a combination of the equation
$\varepsilon(\varphi,\psi,hkl) = F_{ij}(\varphi,\psi,hkl)\,\sigma_{ij}$ (Dölle and Hauk 1979) and the least squares fit. (This combination is called matrix method by the author.)
When trying to introduce the matrix method and, at the same time to point to some other errors and misunderstandings in the science of x-ray stress measurement, unexpectedly quite harsh resistance came from parts of the science community. Resistance which obviously was due to an unwillingness to take new ideas into consideration. This will also be discussed in the talk.