

27. Stullenseminar

Mathematische Texturanalyse Helmut Schaeben

Jul 2, 2002, 12.45 – 13.45, HS Geologie, AvH - Bau

Texture, i.e. crystallographic preferred orientation, is a constitutive property of polycrystalline materials like rocks, metals, and biomaterials. The texture reveals information about fabric developments, deformation and recrystallisation. In addition, it provides a first degree approximation of macroscopic anisotropic physical properties of polycrystalline materials.

The talk will provide an introduction to the objective of texture analysis, and a brief survey of physical experiments and mathematical methods applied in texture analysis.

Individual crystallographic orientation measurements are sampled with electron back scatter diffraction (EBSD). Being left cosets of rotations they differ from common statistical data by their scale, and for physical reasons they do not generally comply with the independence assumption of classical statistics. Therefore, their analysis requires novel methods as being developed by Gerald van den Boogaart.

Summary orientation data are sampled with X-ray, neutron or synchrotron diffraction and are modelled as the result of an incomplete scan of the X-ray transform of the orientation probability density function. Then, the approximate determination of the orientation distribution requires the resolution of a problem of spherical mathematical tomography.

The talk will emphasise the bright prospects for a special interest group “Texture Analysis in Geology” at Freiberg. A 4-day short course on the subject with invited lecturers from Aachen, Basel, Bayreuth, Rossendorf, and Zürich will be held in Freiberg, Feb. 10 - 14, 2003.