Séminaire PIMM
Jeudi 16 février 2012 à 14 heures
Salle structure
Arts et Métiers ParisTech, 151 bd de l'hopital, 75013 Paris

14h00
Marianna Marciszko
Doctorant AGH-University of Science and Technology and PIMM

STRESS GRADIENTS IN SURFACE LAYERS MEASURED USING GRAZING INCIDENT X-RAY DIFFRACTION

The geometry based on the multireflection grazing incidence X-ray diffraction can be applied to measure residual stresses. Using this method, it is possible to perform a non-destructive analysis of the heterogeneous stresses for different and well defined volumes below the surface of the sample (range of several μm). The geometry based on the grazing incidence X-ray diffraction can be also used for measurement of lattice elastic deformation and distortion from the displacement and broadening of the diffraction peak. Measurements and method verification were performed using classical X-ray diffractometer and synchrotron radiation with different wavelengths.

14h40
Andrej Baczmański
Faculty of Physics and Applied Computer Science, AGH-University of Science and Technology, Poland

DETERMINATION OF ANISOTROPIC AND HETEROGENEOUS STRESSES IN POLYCRYSTALLINE MATERIALS USING DIFFRACTION AND MODELLING

Due to its selectivity, diffraction is a powerful tool used to analyse the mechanical behaviour of polycrystalline materials at the mesoscale (phase and/or grain scale). The main advantage of the diffraction methods is the possibility of studying mechanical properties of polycrystalline materials separately in each phase and in groups of grains with a specific orientation. We present application of the neutron and X-ray diffraction to study stresses during "in situ" tensile loading and after sample unloading. Also, the process of the residual stresses relaxation in annealed materials will be discussed.

15h40 Café