The critical dynamic behavior in the isotropic Heisenberg ferromagnet EuO can be tested by inelastic neutron scattering. Below the ferromagnetic Curie temperature $T_c$ we observed magnetic excitations (spin waves) and above this temperature the critical magnetic scattering, which is reduced to the large spin fluctuations near the ferromagnetic phase transition, was measured. We can understand the critical dynamic behavior by taking into account the strong dipolar effects at wavenumbers $q$ below $0.1 \AA^{-1}$. The dipolar interaction, i.e. the action of an internal magnetic field produced by critical fluctuations on the fluctuations themselves, plays a pronounced role, because it covers the dynamic scaling behavior in a certain well understood $q$-T-domain. We compared our results to recent mode-coupling computational results into account. Thus the principle of universality is maintained.

Electron Diffraction From Surfaces LEED, RHEED, PED, etc.

Reflection high-energy electron diffraction (RHEED) is one of the methods in order to determine atomic structures of crystal surfaces. For the determination, intensity rocking curves are analyzed by RHEED dynamical calculations. High energy electrons are scattered dominantly in the forward direction by atoms. Therefore dynamic diffraction mainly occurs in a forward direction. Using this feature, it is possible to a diffraction condition in which electrons are diffracted mainly by lattice planes parallel to the surface, when the incident direction is chosen at a certain azimuthal angle with respect to a crystal zone axis. This diffraction condition is named the one-beam condition, because the main diffraction beam is simply the specular one. At this condition, the rocking curve of the specular reflection intensity is a function of surface normal components of atomic positions, but scarcely depend upon lateral components of them. The rocking curve is also a function of atomic densities of surface parallel layers. Therefore surface normal components of atomic positions and densities of surface layers are determined by dynamical calculation analysis of a one-beam rocking curve with short computation time. We can easily analyze surface structure changes by adsorption, epitaxial growth and phase transition processes by the one-beam method. Using the results at the one-beam condition, lateral components of atomic positions are determined by analysis of rocking curves at many-beam conditions, where the direction of the incident beam is chosen along a low-order crystal zone axis.