

## **High resolution inelastic x-ray scattering**

*G. Monaco*

European Synchrotron Radiation Facility, Grenoble (France)

Inelastic x-ray scattering techniques have been strongly developed with the advent of third generation synchrotron radiation sources as the European Synchrotron Radiation Facility in Grenoble. The unprecedented high brilliance and flux of these sources have made in fact these class of experiments finally fully feasible.

Among the different inelastic x-ray scattering techniques, the one optimized for experiments requiring a high energy resolution in the meV range to access the high-frequency dynamic properties in both crystalline and disordered systems has been one of those who has more quickly matured. This technique is clearly complementary to the more traditional inelastic neutron scattering techniques, and is nowadays routinely exploited in research areas where the use of neutron scattering is difficult if not impossible: i) the study of phonon dispersion curves in crystals available only in small quantities, or brought to extreme conditions of pressure and/or temperature; ii) the study of the vibrational dynamics in disordered systems.

Here an overview of the technique and of its current capabilities will be presented, with the help of examples of recent applications on both crystalline and disordered systems.