Abstract

Water properties are dominated by the Hydrogen Bond (HB) interaction that gives rise in the stable liquid phase to the formation of a dynamical network. The latter drives the water thermodynamics and is at the origin of its well known anomalies. The HB structural geometry and its changes remain uncertain and still a challenging research subject. We present here a study of this phenomenon by taking into account old and new Deep Inelastic Neutron Scattering and NMR studies in liquid, ices and amorphous states of water, in the wide temperature interval ranging from the superheated to the supercooled regime. The obtained results provide a clear picture of the change with temperature in the system local order, by confirming the suggestion coming from thermodynamic data of a temperature that marks the onset of the tetrahedral network.