100. Title: Elastic anomalies at terahertz frequencies and excess density of vibrational states in silica glass

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Abstract: We study the temperature dependence of acousticlike excitations measured by means of inelastic x-ray scattering at terahertz frequencies in silica glass. The apparent sound velocity shows, between 300 and 1600 K, the same temperature variation measured, at lower frequencies, by Brillouin light scattering. On the contrary the vibrations at the boson peak (BP) present a much stronger temperature dependence, as indicated by neutron scattering data. The measured dispersion and damping are used to compute the contribution to the vibrational density of states (VDOS) coming from the propagating acousticlike modes. This part of the VDOS accounts only for a fraction of the BP intensity, indicating that other kinds of excitation accumulate in this frequency range. It is consequently not surprising that the BP does not follow the temperature evolution of the Debye frequency, which describes the modification of the continuum medium. Finally we present a comparison between the experimentally accessible quantities and a recently proposed model for the vibrations in glasses, based on the assumption of random spatial variations of the shear modulus