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标题: Vibrational Collective Dynamics of Dry Proteins in the Terahertz Region
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摘要: The coherent density fluctuations of a perdeuterated dry protein have been studied by Brillouin neutron spectroscopy. Besides a nearly wavevector-independent branch located around 5 meV, a propagating mode with a linear trend at low wave:vector Q is revealed. The corresponding speed of 3780 +/- 130 m/s is definitely higher than that of hydrated proteins. Above Q = 0.8 angstrom(-1), this mode becomes overdamped, with lifetimes shorter than 0.1 ps, in fashion similar to glassy materials. The present results indicate that dry proteins sustain coherent density fluctuations in the THz frequency regime. The trend of the longitudinal modulus indicates that in this frequency range dry biomolecules are more rigid than hydrated proteins.
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