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**Phonon effect on elementary excitations in one-dimensional Mott insulators** HIROAKI MATSUEDA, Sendai National College of Technology, AKIHIRO ANDO, Institute for Materials Research, Tohoku University, TAKAMI TOHYAMA, Yukawa Institute for Theoretical Physics, Kyoto University, SADAMICHI MAEKAWA, Institute for Materials Research, Tohoku University — We examine the interplay among phonons and elementary excitations in one-dimensional Mott insulators. For this purpose, we perform dynamical density matrix renormalization group calculations for the single-particle excitation and optical absorption spectra in the extended Hubbard-Holstein model. We find that the elementary excitations in the Mott insulators are quite easily modified by the phonons. In particular, the spinon branch in the single-particle excitation spectrum can be broadened, even when the phonons only couple with charge degrees of freedom. In addition, the exciton in the photoexcited state becomes polaronic, and this polaronic feature is enhanced by increasing the on-site Coulomb repulsion. We show the origins of these novel properties, and discuss implications of the present results in light of spectroscopic measurements in 1D cuprates.

Hiroaki Matsueda  
Sendai National College of Technology

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