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Theory of Raman Scattering in One-Dimensional Quantum Magnets MASAHIRO SATO, Aoyama Gakuin University, HOSHO KATSURA, Gakushuin University, NAOTO NAGAOSA, University of Tokyo — Raman scattering is one of the powerful tools to study the quantum dynamics of the spin systems, and has been studied for a long term. Conventionally, Raman scattering spectra have been interpreted in terms of the two-magnon processes, from which the exchange coupling can be estimated. However, it is known that the magnon is not a good elementary excitation in low- dimensional quantum spin systems, especially in 1D, and the theoretical studies on the Raman processes in 1D have not been developed compared with those for other electromagnetic processes such as NMR and ESR. Here we have developed a theory for Raman scattering of 1D quantum magnets. We show that Raman spectrum can detect some interesting excitations such as spinon pairs, solitons, etc, depending on the additional interactions to the conventional Heisenberg one and polarization direction of external electromagnetic wave.

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