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Significant Role of Current Vertex Correction in Optical Conductivity of Strongly Correlated Systems. SEIICHIRO ONARI, HIROSHI KONTANI, Nagoya University, Japan — Based on the microscopic Fermi liquid theory, we study DC and AC transport phenomena in strongly correlated systems. We take the current vertex correction (CVC), which is called the backflow in the phenomenological Fermi liquid theory, into account correctly to satisfy the conservation laws. In the vicinity of the antiferromagnetic (AF) quantum critical point (QCP), various transport coefficients show striking deviations from the Fermi liquid-type temperature dependences due to the CVC. Moreover, we find that the frequency dependence of the CVC gives rise to striking deviations of the optical conductivities from the conventional extended-Drude-type functions, when systems is close to the AF-QCP. We explain the important effect of the CVC on the temperature- and frequency-dependences of $\sigma(\omega)$ and $\sigma_{xy}(\omega)$ in strongly correlated systems.

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