

## Optical conductivity of Coulomb systems

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Our challenge is to define high-frequency (optical) conductivity of non-ideal metallic plasmas. The classical Drude formula for the complex conductivity

$$\sigma(\omega) = \frac{\sigma_0}{1 - i\omega\tau}$$

should be in general modified with account of quantum corrections. The simplest of those is subject to the non-zero probability that electron and ion are localized at the same point. We find and investigate the corrected Drude expression obtained in the one-electron approximation with account of this correction using as tools the method of Green functions, the theory of moments and the method of pseudo-potentials. We have used the modified formula as applied to aluminium and compared what came out with corresponding results of computer simulation and also we have calculated the optical conductivity of liquid sodium and sodium vapour on the co-existence line using for determination of static conductivity  $\sigma_0$  in the modified formula an appropriate pseudopotential.