Electrical resistivity of liquid expanded metals by Ziman approach

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Transport properties of metals near the critical points were intensively studied [1, 2]. Using quantum dynamics simulations, we consider the structures of liquid aluminum and copper at high equilibrium temperatures and strong compression. On the other hand, we carry out classical molecular dynamics (MD) simulations using the embedded-atom method (EAM) interatomic potentials. Both approaches provide data for resistivity calculations based on the well-known Ziman–Evans (ZE) formula. The results of these calculations show a weak dependence on the used methods of ion structure computations. Also, we demonstrate that an effect of electron temperature, which is implemented in the effective electron–ion potential used in the ZE formula, is negligible at electron temperatures less than 30 000 K. This work has been supported by Russian Science Foundation (grant No. 14-19-01599).

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