



Ab initio study of the electronic transport properties of silicates.

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The Kepler spacecraft led to the discovery of numerous Super-Earths planets. Little is known about them, as there is no equivalent in the Solar System. It is uncertain whether they have a convective mantle like the Earth. It is also unclear if their mantle is insulating or conducting. In the latter case, for instance, the mantle could generate a magnetic field via dynamo processes. In order to better understand the properties of the silicates under pressure-temperature conditions relevant for the interiors of Super-Earth, we performed ab initio simulations based on density functional theory. We specifically explored the electronic transport properties, conductivity and reflectivity, to characterize their behavior in their different phases. We find that liquid and solid silicates behave differently and discuss the consequences for the planetary interiors.