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Charge Density Wave Gap in $ZrTe_3$ ANDREA PERUCCHI, LEONARDO DEGIORGI, ETH Zurich, HELMUT BERGER, EPF Lausanne — The transition metal trichalcogenides ($MX_3, M = Ta, Nb$) have been widely studied as prototype examples of linear chain conductors exhibiting novel charge density wave (CDW) phenomena. The title compound is semimetallic with linear chain structure but quasi-two-dimensional conductivity. At T_{CDW}=63 K it undergoes a phase transition, which most strongly affects its conductivity components perpendicular to the conducting chains, and it becomes superconducting at 2 K. We have measured the optical reflectivity from the far-infrared up to the ultraviolet spectral range as a function of temperature and with light polarized both along and perpendicular to the chains. Through Kramers-Kronig transformation we have extracted the optical conductivity. We found optical evidence for the CDW gap, which opens over a tiny amount of the Fermi surface. The temperature dependence of the gap follows the BCS behaviour for an order parameter. The role played by fluctuation effects will be also discussed.

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