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Electronic transport and Luttinger behavior in polymer thin films in the quasi-atomic limit¹ AARON SZASZ, RONI ILAN, Univ of California - Berkeley, JOEL MOORE, Univ of California - Berkeley, Lawrence Berkeley National Laboratory — Recent experiments have shown two-dimensional polymer films to be promising materials for thermoelectric devices, but some of the observed properties are not well understood. To better understand these materials, we introduce a new model in which each polymer is a Luttinger liquid and the polymers are weakly coupled to each other. This approximation of strong interactions within each polymer and weak coupling between them is the “quasi-atomic limit.” We find integral expressions for transport coefficients, including the electrical and thermal conductivities and the thermopower, and we extract their power law dependencies on temperature. Luttinger liquid physics is manifested in a violation of the Wiedemann-Franz law.

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