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Heat transfer in model amorphous solids[1] VINCENZO VITELLI, NING XU, Department of Physics, University of Pennsylvania, MATTHIEU WYART, HSEAS, Harvard University, ANDREA LIU, Department of Physics, University of Pennsylvania, SIDNEY NAGEL, James Frank Institute, University of Chicago — We investigate heat transfer in model amorphous solids obtained from jammed packings of soft spheres. At the boson peak frequency, we find a sharp crossover from a weak-scattering regime, in which the energy diffusivity drops rapidly with frequency, to a strong-scattering regime, in which the diffusivity is nearly frequency-independent. We present a scaling analysis of how the crossover frequency shifts to zero as the system is decompressed towards the jamming transition. We show that the regime of flat diffusivity, invoked to explain the temperature dependence of the thermal conductivity of glasses, can arise from properties of the jamming transition.

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