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ac-Calorimetric Measurements of Transverse Thermal Conductivity[1] HAO ZHANG, JOSEPH BRILL, University of Kentucky — We are developing an ac-calorimetric technique, heating one surface of a thin sample with oscillating power and measuring the temperature oscillations on the opposite surface, to measure the thermal conductivity of solids. While the temperature oscillations are inversely proportional to the heat capacity at low frequencies, at higher frequencies the response is limited by the transverse thermal diffusivity. Because of the response times of thermometers and the fact that the magnitude of the temperature oscillation varies inversely with frequency, this technique is most useful for materials with low thermal conductivities, such as the interlayer conductivity in layered materials. We will show results on "standard" materials (teflon, sapphire) as well as the layered organic semiconductors, rubrene and TIPS-pentacene.

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