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Temperature dependent optical properties and thermal conductivities of single- and few-layer MoS_2 XIAN ZHANG, DEZHENG SUN, GWAN-HYOUNG LEE, YUMENG YOU, XU CUI, TONY HEINZ, JAMES HONE, YILEI LI, Columbia University — The transition metal dichalcogenide, MoS_2 have shown unique optical and electrical properties, such as band structure transition, high mobility, and strong photoluminescence, in a monolayer form. Here we investigate the thermal transport properties in exfoliated monolayer and bilayer MoS_2. By measuring the Raman peak shift in response to laser heating, and the Raman peak shift with temperature variation, we obtain the room-temperature thermal conductivity and the interface conductance of about (75+34/-26)W/mK and (0.24+0.06/-0.06)MW/m^{2}K for supported monolayer MoS_2. And the thermal conductivity of the suspended monolayer MoS2 is around (81+12/-11)W/mK at room temperature, and (60+11/-9)W/mK at 500K.

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