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Electrical transport measurements on monolayer and few-layer MoSe2 and WSe2 ZAIYAO FEI, JOE FINNEY, YUN LING, SERKAN KASIRGA, XIAODONG XU, DAVID COBDEN, Univ of Washington — The two-dimensional monolayer semiconductors WSe2 and MoSe2 have recently been shown to have excellent optical properties, but their intrinsic electrical properties, relevant to many device applications, remain undetermined. This is due to the difficulty of obtaining good contacts and applying a sufficient electric field to induce carriers, especially at lower temperatures. We have investigated a range of device geometries and contact techniques aimed at improving the situation. So far we have achieved ambipolar gating of the linear-response conductance persisting at temperatures down to 4 K with contact resistance for both carrier of around 50 kiloohm at room temperature. Four terminal Hall-bar measurements have been made to separate the contact resistance, sheet resistivity, carrier density and mobility. Methods are being explored to eliminate large intrinsic contact noise.

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