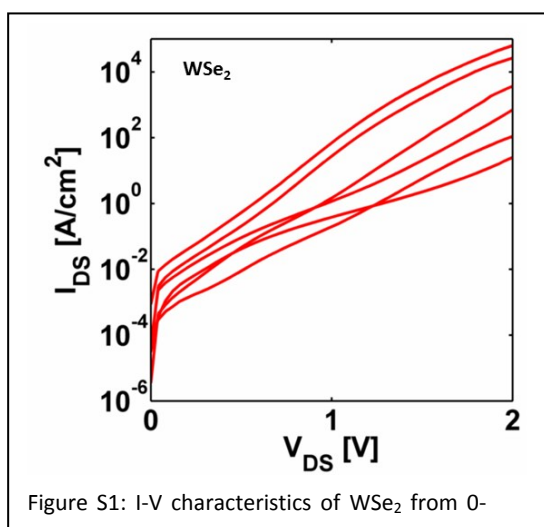


Supplementary Material for Vertical charge transport through transition metal dichalcogenides – A quantitative analysis –



The electrical characteristics of a subset of WSe₂ shown in figure 2B is shown in figure S1 from 0-2V. The conductivity reaches more than 10⁴ S/cm² at V_{DS}=2V.

Figure S2 A and B show the calculated dependence of the I-V and FN characteristics as a function of body thickness. Note that the thickness dependence becomes trivial for the FN-tunneling current for a constant electrical field; whereas for the thermal injection current it is only trivial (i.e. constant) for a constant voltage. The thickness values range from 10nm to 30nm in steps of 5nm. For comparison, experimental data and simulation results are shown in figure S2 C and D. For MoS₂, the thickness values used for the simulations are 8nm, 16nm, and 30nm, whereas the real thickness values range from 8nm to 32nm. For WSe₂, the thickness values used for the simulations are 10nm, 16nm, and 25nm, whereas the real thickness values range from 10nm to 27nm. A good agreement between simulation and experiment is clearly apparent.

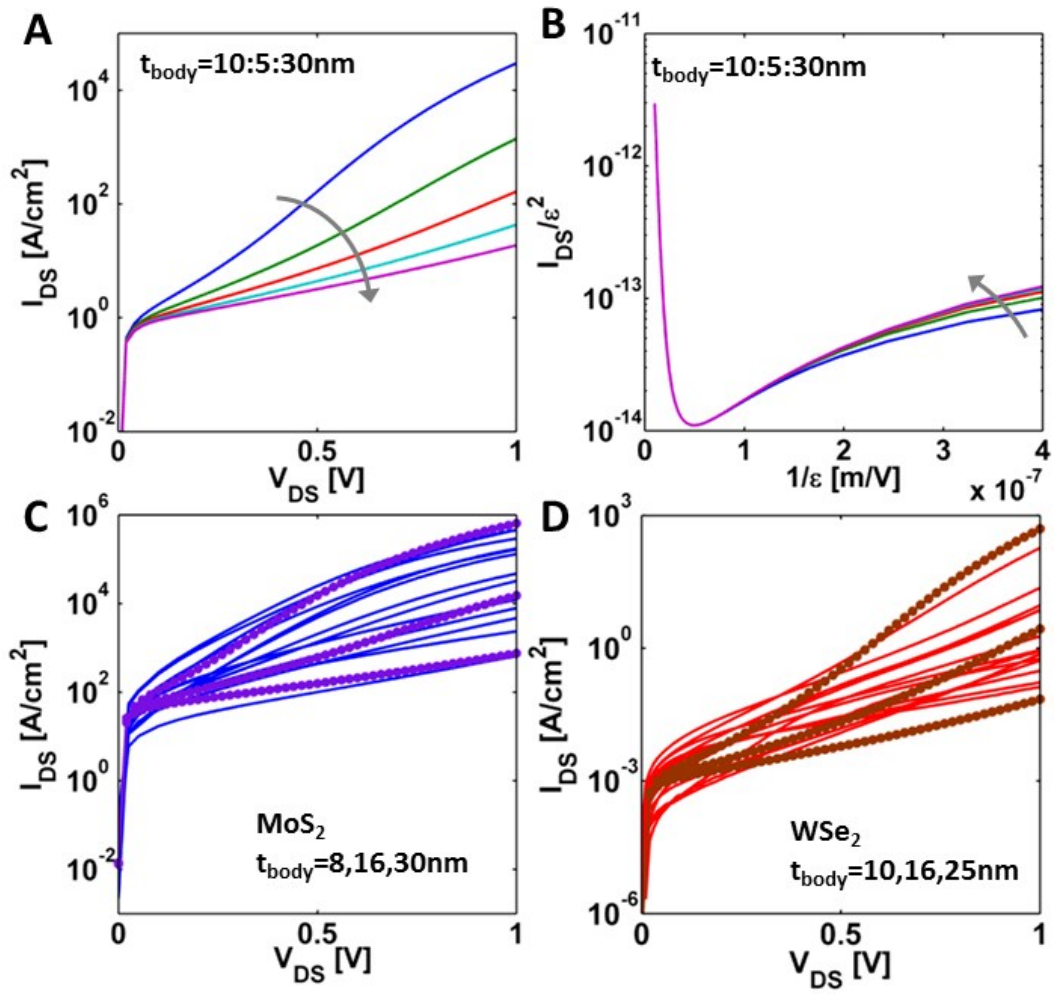


Figure 2S: A and B display the thickness dependence of the I-V and FN characteristics, for $m^* = 0.15m_0$. C and D show experimental data and simulation results for different MoS_2 and WSe_2 thicknesses. In C the experimental values (blue lines) for t_{body} range from 8 to 32nm and the simulations (purple dots) are for 8nm, 16nm and 30nm respectively. In D the experimental values (red lines) for t_{body} range from 10 to 27nm and the simulations (brown dots) are for 10nm, 16nm and 25nm respectively.