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Extrinsic control of collective transport in quasi-1D materials with end contacts geometry[1] A.F. ISAKOVIC, A. BELKADI, Khalifa University - KUSTAR, Abu Dhabi, UAE, K. EVANS-LUTTERODT, BNL-NSLS, NY, USA — End contacts to mesowires of $NbSe_3$ and TaS_3 were nanofabricated and tested with transport, noise and X-ray microdiffraction measurements. We measured unusual and unexpected weak dependence of collective current on temperature in the [70K, 90K] range, close to $2/3T_{P1}$ point, indicating a modification of CDW condensate transport due to the end contact geometry. This is accompanied with modifications to the temperature dependence to of the phase slip voltage. We also report a partial control of the threshold field (E_T) for CDW sliding, below T_{P2}, with the decrease in E_T by as much as one order of magnitude in a limited temperature range below $2/3T_{P2}$. These changes can be also seen in electric field modified X-ray topography images performed with sub-micron focused synchrotron X-rays (X13B beamline at NSLS). The most likely causes of these phenomena when end contacts are applied, are in modifications of: (a) carrier injection efficiency and, (b) the phase loop formation mechanism.

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A. F. Isakovic
Khalifa University - KUSTAR, Abu Dhabi, UAE

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