

Abstract Submitted  
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**Junctionless nanowire field-effect transistor versus inversion mode devices** BART SOREE, IMEC, Kapeldreef 75, B-3001 Leuven, Belgium. Universiteit Antwerpen, Physics department, Groenenborgerlaan 171, B-2020 Wilrijk, Belgium, ANH-TUAN PHAM, DRIES SELS, AN DE KEERSGIETER, WIM MAGNUS — Several years ago, a novel device concept was proposed : the nanowire (NW) iJFET [1]. Today, this device concept is being explored by several research teams [1-3] and is also known as the pinch-off FET (POFET) or junctionless transistor. The most important advantage of the junctionless transistor is the uniform doping throughout source, channel and drain which greatly simplifies its fabrication. We have performed modeling and simulations to compare the performance of the junctionless pinch-off FET with that of inversion mode devices. In order to make the comparison, we address the regime of thick and long nanowires through analytical modeling of the current- voltage characteristics, while for long and thin nanowires we perform dissipative transport modelling to obtain the low-field mobility. Finally, ballistic transport modelling is performed using the sub band decomposition method for ultra- short nanowires.

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Bart Soree  
IMEC, Kapeldreef 75, B-3001 Leuven, Belgium. Universiteit Antwerpen,  
Physics department, Groenenborgerlaan 171, B-2020 Wilrijk, Belgium

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