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### Abstract:

This paper deals with a technique that extracts the MOSFET parameter using the Y-function technique, in conjunction with the drain current, the transconductance data and the series resistance ( $R_s$ ) in silicon nanowire FET's (Si-NWFET). This technique relies on combining drain current and output conductance, which enables reliable values of the threshold voltage ( $V_{th}$ ), mobility ( $\mu$ ), mobility attenuation coefficient ( $\theta$ ), the series resistance ( $R_s$ ) to be obtained. The extracted drain current, effective mobility total resistance and output conductance values are shown through MATLAB simulation. The extracted results have been shown in good agreement with simulation which expresses the validity of our proposed technique. The technique only requires a single device for extraction of ( $V_{th}$ ) and the iteration procedure for fitting the data.