INFLUENCE OF ACCUMULATION BACK-GATE VOLTAGE ON THE NOISE SPECTRA OF DEEP SUBMICRON SOI MOSFET'S IN A WIDE RANGE OF DRAIN VOLTAGES

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S u m m a r y

The influence of an accumulation back-gate voltage on the Lorentzian component observed in the noise spectra of deep submicron partially depleted metal-oxide-semiconductor field-effect transistors (MOSFETs) at sufficiently high drain voltages has been studied. That component is associated with impact ionization near the drain $p-n$ junction. Such an accumulation back-gate voltage has been demonstrated to substantially affect the magnitude of the Lorentzian time constant and the level of the Lorentzian plateau, and to reduce the drain current. Those effects can be explained in the framework of the model proposed earlier, where the accumulation back-gate voltage is considered as that increasing the conductance of the body-source $p-n$ junction. In addition, the so-called back-gate-induced (BGI) Lorentzians, which originate from the Nyquist fluctuations of that conductance, have been detected at low drain voltages in the noise spectra.