Abstract Submitted
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"Ultimate" SOI MOSFETs THOMAS J. WALLS, KONSTANTIN K. LIKHAREV, Stony Brook University — Silicon-On-Insulator (SOI) field-effect transistors (MOSFETs) are being aggressively scaled toward the 10-nm frontier - see, e.g., Ref. [1]. In our earlier work [2], we have carried out a detailed analysis of the performance and parameter variation sensitivity of double-gate sub-10-nm MOSFETs using a self-consistent numerical solution of the 2D Poisson equation and 1D Schrodinger equation. However, for very small devices the 1D approximation misses some important details of the device physics. In this work, we have used the momentum-space formalism, developed in 1989 by A. Szafer and A. D. Stone [3], to fully account for 2D quantum effects. At the meeting, we will present a comparison of our new results with our previous 1D approximation, as well as calculations of the gate capacitance of the transistors. This work has been supported in part by the ONR.

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[2]V. Sverdlov *et al., IEEE Trans. on Electron Dev.*, vol. 50, pp. 1926-1933, Sep. 2003.
[3]A. Szafer *et al., Phys. Rev. Lett.* vol. 62, pp. 300-303, Jan. 1989

Thomas J. Walls
Stony Brook University

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