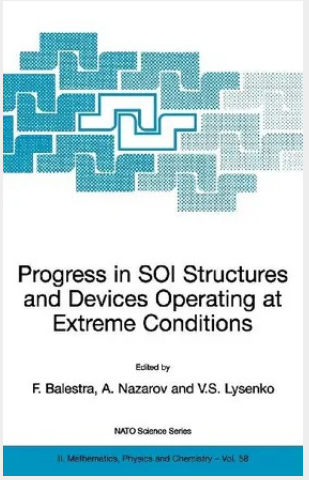
Balestra / Nazarov / Lysenko

Progress in Soi Structures and Devices Operating at Extreme Conditions

A review of the electrical properties, performance and physical mechanisms of the main silicon-on-insulator (SOI) materials and devices. Particular attention is paid to the reliability of SOI structures operating in harsh conditions. The first part of the book deals with material technology and describes the SIMOX and ELTRAN technologies, the smart-cut technique, SiCOI structures and MBE growth. The second part covers reliability of devices operating under extreme conditions, with an examination of low and high temperature operation of deep submicron MOSFETs and novel SOI technologies and circuits, SOI in harsh environments and the properties of the buried oxide. The third part deals with the characterization of advanced SOI materials and devices, covering laser-recrystallized SOI layers, ultrashort SOI MOSFETs and nanostructures, gated diodes and SOI devices produced by a variety of techniques. The last part reviews future prospects for SOI structures, analyzing wafer bonding techniques, applications of oxidized porous silicon, semi-insulating silicon materials, self-organization of silicon dots and wires on SOI and some new physical phenomena.

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