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Research note

## Investigation of (111) wafers and comparison with (100) substrates

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### Abstract

In the last decade, Si(100) has been used as a suitable substrate in field effect transistors. Some issues such as leakage current and tunneling current through the ultrathin films have been increased with shrinking the electronic devices – particularly, field effect transistors – to nanoscale, which is threatening more use of Si(100). We have thus demonstrated a series of experiments to grow ultrathin films on both Si(100) and Si(111) substrates and studied their nanostructural properties to see the possibility of replacing Si(100) with Si(111). The obtained results indicate that Si(111) substrate with silicon nitride film on top is desirable.

**Keywords:** nanotransistors, gate dielectric, Silicon substrate, photoemission spectroscopy techniques

For full article, refer to the Persian section