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Carbon defects at the SiC-SiO₂ interface and the effects of hydrogen and fluorine¹ YINGDI LIU, MICHAEL HALFMOON, SANWU WANG, The University of Tulsa — The channel mobilities in SiC-based metal-oxide-semiconductor field-effect transistors are significantly reduced by the interface defects that produce states in the band gap of the SiC-SiO₂ interface. Therefore, it is of great importance to investigate the nature of the interface defects and the ways for passivating such defects. We used first-principles quantum-mechanical calculations to study the interface defects due to excessive carbon atoms. We report the results about the atomic configurations of the defects and the associated electronic structures, as well as the effects of hydrogen and fluorine in passivating such interface defects.

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