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Band Alignment of atomic layer deposited HfO₂ on clean and N passivated Germanium surfaces ABDUL RUMAIZ, Brookhaven National Laboratory, JOSEPH WOICIK, NIST, GABRIELLA CARINI, PETER SIDONS, Brookhaven National Laboratory, ERIC COCKAYNE, NIST, PATRICK LYSAGHT, SEMATECH, DANIEL FISCHER, NIST — Hard x-ray photoelectron spectroscopy (HAXPES) has been used to study the band alignment between atomic layer deposited (ALD) HfO₂ on clean Ge (100) and nitrogen treated Ge (100) surfaces. The position of the valence-band maximum was determined by convolving theoretically calculated density of states from first-principles calculations and comparing with experimental valence-band data. The valence-band offset was found to be 3.2 ± 0.1 and 3.3 ± 0.1 eV for the samples grown on clean and N passivated Ge, respectively. The oxide charge however shows a significant increase between the two samples. The small change in the band offset between the two systems strongly indicates negligible contribution of the interface to the conduction/valence-band barrier and the band alignment of the heterojunctions.

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