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Measurement of the GaSb surface band bending potential from the magnetotransport characteristics of GaSb-InAs-AlSb quantum wells
PATRICK FOLKES, Army Research Laboratory, GODFREY GUMBS, Hunter College, CUNY, WEN XU, Australian National University, M. TAYSING-LARA, Army Research Laboratory — Low-temperature magnetotransport measurements on GaSb/InAs/AlSb coupled quantum well structures with a GaSb cap layer and self-consistent calculations of their electronic structure have led to the determination of the Fermi level at the surface, E_{FS} , of undoped molecular-beam-epitaxy-grown GaSb. E_{FS} is pinned around 0.2 eV above the top of the GaSb valence band when the GaSb cap layer is width is greater than 900 Å. For smaller GaSb cap widths, E_{FS} decreases with the GaSb width. The heterostructures' Fermi level is determined by bulk donor defects in the AlSb layer adjacent to the InAs quantum well.

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