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Composition Dependence of the Hole Mobility in Dilute $GaSb_xAs_{1-x}$ KIRSTIN ALBERI, O.D. DUBON, U.C. Berkeley, Berkeley, CA 94720; Lawrence Berkeley National Laboratory, Berkeley, CA 94720, K.M. YU, W. WALUKIEWICZ, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, J.A. GUPTA, J.-M. BARIBEAU, National Research Council of Canada, Ottawa, K1A 0R6 Canada — Highly p-type doped $GaSb_xAs_{1-x}$, long considered a promising component for III-V-based double heterojunction bipolar transistors, exhibits an unusually abrupt reduction in the hole mobility in the dilute Sb alloy composition range ($x < 0.2$), which cannot be completely explained by conventional carrier scattering models. We show that this behavior is due to the reconfiguration of the alloy's valence band structure through an anticrossing interaction between the localized and extended *p*-states of the Sb impurities and GaAs host as described by a valence band anticrossing model [1]. Our model suggests that the drop is due to the significant upward movement of the valence band edge as well as an increase in the heavy hole effective mass that enhance the scattering processes in this composition range. K. Alberi, *et al.*, *Phys. Rev. B*, **75**, 045203 (2007).

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