

Gawlik *et al.* Reply: The Comment [1] avoids the main point of our Letter [2], namely, that for HgSe there is no evidence for a bulk conduction band state crossing or touching the valence band maximum determined by photoemission spectroscopy excited with different photon energies. This is a fundamental criterion for a metallic band structure. Therefore, from our experimental data an inverted band structure model for HgSe is *not* supported.

Furthermore, the discussion of quantized charge accumulation states as performed by the authors of the Comment has no relevance for the conclusion of HgSe being a positive gap semiconductor and, in addition, it cannot explain the energy position of a quantized state in the charge accumulation layer which we have observed experimentally. Our data clearly show a state S_0 0.51 eV above the valence band maximum revealing *no* dispersion with variation of photon energy (or k_{\perp}) but *distinct* dispersion with emission angle (or k_{\parallel}) (see Figs. 1 and 2 of Ref. 2). Thus S_0 reveals two-dimensional character and may be assigned to a quantized state in the charge accumulation layer. The structure at 0.4 eV (which we have assigned to the conduction band minimum), in contrast, does show significant dispersion with variation of photon energy (k_{\perp}) (it can be observed only in photoemission for photon energies around 12 eV) and thus cannot be quantized in the charge accumulation layer. The Comment is incorrect in assigning this state to a two-dimensional ground electric subband. In addition, the first excited subband (calculated by the authors of the Comment to lie at 0.625 eV) cannot be observed in the experimental spectra. Instead we ob-

serve the two-dimensional state S_0 at 0.51 eV. However, the simple theory of Ref. [1] cannot explain the energy position of this state.

It should be noted here that band bending at the surface of any semiconductor leads to a shift of all (valence and conduction band) states relative to the Fermi level. This does not alter the separation between valence and conduction band states (band gap). The energy position of the quantized state in the charge accumulation layer relative to the bulk valence band maximum as discussed by the authors of the Comment is certainly of no relevance for the value of the bulk band gap.

K.-U. Gawlik, L. Kipp, and M. Skibowski
Institut für Experimentelle und Angewandte Physik
Universität Kiel
D-24098 Kiel, Germany

N. Orłowski and R. Manzke
Institut für Physik
Humboldt-Universität Berlin
D-101115 Berlin, Germany

Received 11 June 1998 [S0031-9007(98)06861-6]
PACS numbers: 73.20.At, 79.60.Bm

- [1] T. Dietl *et al.*, preceding Comment, Phys. Rev. Lett. **81**, 1535 (1998).
- [2] K.-U. Gawlik, L. Kipp, M. Skibowski, N. Orłowski, and R. Manzke, Phys. Rev. Lett. **78**, 3165 (1997).