Dharma-wardana Replies: In our study [1] we adopted the same model of hot carriers as did Das Sarma, Jain, and Jalabert [2], viz., hot electrons coupled to LO phonons, which are themselves *coupled to the lattice via acoustic phonons.* Das Sarma, Jain, and Jalabert have argued, in many publications [2] and conference proceedings, that coupled-mode formation leads to an "orders-of-magnitude" *increase* in the energy-loss rate (ELR) over and above that given by the Kogan formula, due to contributions from quasiparticlelike modes. The experimental ELRs are usually *lower* than that from Kogan's formula. This claim of Das Sarma, Jain, and Jalabert is based on heuristic modifications to the Fermi-"golden-rule" (FGR) result. In contrast to Ref. [2] we found that *quasiparticlelike* coupled modes *do not* contribute to the ELR, while the remaining coupled modes give a *lower* ELR compared to that predicted by Kogan's formula.

Contrary to the suggestion made in the Comment [3], our result is not based on some assumed phonon "bottleneck" model. Instead of starting from the Fermi "golden rule," we rigorously identify the Green's function $\mathbb{G}$ [see our Eq. (3)] determining ELR, giving adequate technical details of this. From then on it is really a tedious technical exercise, requiring no further assumptions, to evaluate $\mathbb{G}$ in zero order (to yield the Kogan formula), or in RPA inclusive of coupled modes to obtain our Eqs. (6) and (8). These calculations involve the reduction of messy commutators in Zubarev's method, and dealing with coupled $\mathbb{G}$ functions in the Keldysh method. Such details provide no physical insight. Instead, in the Letter we related the structure factors to distribution functions, and showed that our Eq. (8) is physically easy to comprehend.

The Comment *incorrectly* states that "The misunderstanding of Ref. [1] is the noninclusion of the decay of the emitted LO phonons into acoustic phonons . . ." [see our Eq. (2) *et seq.*]. Since we were following Das Sarma's model to comprehend the origin of their claim of orders-of-magnitude increase in ELR, the LO-phonon coupling to acoustic phonons was included phenomenologically as in Ref. [2], and as in Senna and Das Sarma (Ref. [4] of our Letter) [4]. Our "bare-phonon" propagator is exactly that given in Eq. (15) of Ref. [2]. And it is this bare-phonon propagator which occurs in the coupled-mode form given in Eq. (29) of Ref. [2] and related work where an orders-of-magnitude increase in ELR was found. Hence this aspect of the Comment is tantamount to a criticism of the model of Ref. [2] used by Das Sarma, Jain, and Jalabert.

We do not have to defend the model of Das Sarma, Jain, and Jalabert [2]. Instead, let us include a lifetime effect in the bare-phonon propagator either by evaluating the Green's functions contained in $\tau_{e,ap}$ of Eq. (2) of Ref. [1], or more heuristically by introducing a $p_2(q,\omega)$ as in the Comment. It is easily verified that any reasonable coupling to the acoustic-phonon decay channel does not give a $p_2(q,\omega)$ broad enough to modify any of the conclusions given in our Letter.

From their Comment it seems that Das Sarma and Korenman do not actually disagree with our Eqs. (6) and (8), but even have "heuristic" (Das Sarma) and "semi-rigorous" (Korenman) unpublished proofs. But the statement "the thesis of Ref. [1] is that bottleneck or hot-phonon effects bring . . ." contained in the Comment makes us worried about Das Sarma's "heuristic" proof, since no such thesis should be necessary (or used in our work). Further, our Eqs. (6) and (8) do not assume that $\tau_{CM} \sim 1/\omega \gg 1/\omega_{LO}$, but we stated that in evaluations *beyond RPA*, there are processes with such time scales (as well as other time scales) and that the calculation beyond RPA is difficult. Our Eq. (8), our conclusions, or the numerical results shown, do not depend on such *beyond-RPA* considerations.

Our Eqs. (6) and (8) for the ELR turned out to have the *form* of the Fermi-"golden-rule" expression containing renormalized quantities. The robustness of the "renormalized" FGR is often encountered, e.g., in the x-ray edge problem. In renormalizing FGR, it is inconsistent to replace *only* the phonon spectral function by the renormalized form (coupled mode form) while retaining the bare-phonon distribution. *This was the error that gave orders-of-magnitude-larger ELR in the calculations of Das Sarma and Korenman.* Now that Das Sarma and Korenman have a heuristic derivation of our Eq. (8) they should be able to do the numerical calculations and confirm the result of Ref. [1] that there is no orders-of-magnitude increase in the ELR due to coupled-mode formation, even if they include a $p_2(q,\omega)$ several times bigger than some plausible estimate.

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[3] S. Das Sarma and V. Korenman, preceding Comment, Phys. Rev. Lett. **67**, 2916 (1991).
[4] The note in Ref. [6] of the Comment claims that we have ignored the hot-phonon literature and gives exactly our Ref. [4] and a reference to Kocevar (cf. our Ref. [2]).