

pair-breaking interaction has the correct time dependence  $\omega = 2eV/\hbar$ . The ac Josephson field of the junction has this time dependence.

Figure 3(a) shows a diagrammatic expansion of the tunneling current using the standard notation of Ref. 6. The proposed mechanism consists of the breaking of a pair under the influence of an oscillating field and leads to structure at  $eV = 2\Delta/2$  ( $\Delta = \Delta_1, \Delta_2$ , respectively).

The higher-order members of the even series at  $2\Delta/2n$  (i.e.,  $\Delta_1/n$  and  $\Delta_2/n$  with  $n = 2, 3, \dots$ ) require the absorption of a Josephson photon. Figure 3(b) shows the corresponding diagram which includes the interaction with the oscillating field only to lowest order. Both Figs. 3(a) and 3(b) give structure proportional to  $|M|^2$  if the ac

Josephson amplitudes saturate.

While the diagrams 3(a) and 3(b) for the even series give structure in the pair current [(9.13c) in Ref. 6], Fig. 3(c), which is given for completeness only, produces structure in the single-particle current [(9.13b) in Ref. 6] at  $eV = 2\Delta/(2n+1)$ , as discussed by Werthamer.

Figures 3(b) and 3(c) are similar and involve two interactions with the oscillating field, while 3(a) involves only one interaction. This is consistent with the experimental observation that the mid-gap structure shows up before the rest of the structure and that the higher-order even series and the odd series are of comparable intensity.

The authors wish to thank Dr. B. Bürgel who contributed the analytical solution of Eq. (2).

<sup>1</sup>I. Giaever and H. R. Zeller, Phys. Rev. B 1, 4278 (1970).

<sup>2</sup>J. W. Wilkins, in *Tunneling Phenomena in Solids*, edited by E. Burstein and S. Lundquist (Plenum, New York, 1969).

<sup>3</sup>N. R. Werthamer, Phys. Rev. 147, 255 (1966).

<sup>4</sup>A. Dayem and R. J. Martin, Phys. Rev. Letters 8, 246 (1962).

<sup>5</sup>E. Riedel, Z. Naturforsch. 19A, 1634 (1964).

<sup>6</sup>C. B. Duke, in *Solid State Physics*, edited by F. S. Seitz, D. Turnbull, and H. Ehrenreich (Academic, New York, 1969), Suppl. 10, Chap. 19.

## ERRATUM

**Spin Correlation and Entropy**, H. Falk and Masuo Suzuki [Phys. Rev. B 1, 3051 (1970)]. Several typographical errors (which do not propagate to the results) should be noted: In each of Eqs. (1.5)–(1.7) the extra  $\ln$  terms should be deleted. In Eq. (3.11) the sine and cosine definitions should be interchanged. The left-hand side of Eq. (3.24) should read  $2^{-N} Z$ .