Errata

Space-Charge Limited Current Relation in High-Pressure Gas Diodes, R. FORMAN [Phys. Rev. **123**, 1537 (1961)]. In our paper we derived an expression, consistent with our experimental data, showing that the space-charge current, J, in a high-pressure gas diode varies as $V^{\frac{3}{2}}$ and $p^{-\frac{1}{2}}$ (V and p are voltage and pressure, respectively). Subsequently, it was brought to our attention by Dr. H. F. Ivey that he had theoretically derived[1] similar space-charge expressions for conduction in dense gases showing that $J\propto V^{\frac{3}{2}}$ for the case of very high electric fields. We regret the omission of this reference.

Since publication of the manuscript, we have discovered that Richardson and Bazzoni in some very early work[2] also predicted $J\propto V^{\frac{3}{2}}$ in space-charge limited high-pressure gas diodes. Their attempts at experimental verification, however, were not conclusive.

[1] H. F. Ivey, *Advances in Electronics and Electron Physics*, edited by L. Marton (Academic Press, Inc., New York, 1954), Vol. 6, p. 137.
[2] O. W. Richardson and C. B. Bazzoni, Phil. Mag. **32**, 426 (1916).

Nuclear Quadrupole Interaction in Pure Metals, T. P. DAS AND M. POMERANTZ [Phys. Rev. **123**, 2070 (1961)]. In Eq. (2), the fifth term in the brackets should be $Y_{lm}(\theta_j\phi_j)/r_j^{l+1}$ instead of $Y_{lm}(\theta_j\phi_j)$; in the same equation, in the sixth term the factor i^l should be replaced by $(-i)^l$ and $\sum_j{}'$ should be replaced by $\sum_\lambda{}'$. The first and third of these errors were typographical errors in the manuscript. The second error has no effect on our results because l is even in our calculations. We are grateful to Dr. F. W. deWette for bringing these errors to our attention.

Charged Boson Gas, LESLIE L. FOLDY [Phys. Rev. **124**, 649 (1961)]. A factor of $\frac{1}{2}$ was inadvertently omitted in the expression for the ground-state energy U_0 as given in Eq. (12). This same factor is then absent in the constant S as defined by Eq. (18), whose numerical value is thus changed to -0.803. The final equation (22) for the ground-state energy per particle, u_0, should then have in place of $-1.606r_s^{-\frac{3}{4}}+0.425$, the expression $-0.803r_s^{-\frac{3}{4}}+0.213$.

Fission of a Hot Plasma, NORMAN ROSTOKER AND ALAN C. KOLB [Phys. Rev. **124**, 965 (1961)]. On p. 965, the second sentence of column two should read: "The ion cyclotron frequency is estimated to be $\omega_I\cong 2\times10^8$ sec^{-1} for ions immersed in the plasma at the onset time of the instability, and the ion Larmor radius is $a_I\cong1$ mm." On p. 969, in the first sentence of column one, "$\Omega\cong2-5\times\Omega_0$" should read: "$\Omega\cong0.2-0.5\times\Omega_0$."

Intermediate Meson Contributions to Hyperon Decays, DAVID R. HARRINGTON [Phys. Rev. **124**, 1290 (1961)]. Because of an algebraic error the expression given for $D(s)$ in Eq. (27) is one-half of the correct expression. The numerical results given in Tables III and IV should therefore be multiplied by two. This increases the importance of the two-meson contribution to the decays $Y\rightarrow N+\pi$, but otherwise the conclusions drawn in Sec. 5 are essentially unchanged.

Reactions of Alpha Particles with Tin-124, R. L. HAHN AND J. M. MILLER [Phys. Rev. **124**, 1879 (1961)]. Recent data[1] on the decay of the Sb^{126} isomers indicate that our cross-section measurements for the (α,pn) reaction are high by a factor of 2. That is, the 0.68-Mev γ ray, which was assumed to occur in 100% of the decays, appears to be a composite of two coincident gamma rays, of energy 0.665 and 0.695 Mev. Each of these gamma rays is reported to occur with unit probability per disintegration.

[1] *Nuclear Data Sheets* (National Academy of Sciences-National Research Council, Washington, D. C., 1961).

Relaxation Equations for Two-Magnon and Magnon-Phonon Processes in Ferrimagnetic Resonance, P. E. SEIDEN [Phys. Rev. **124**, 1110 (1961)]. The equation for n_k in the case of small spin-wave amplitudes [equation directly above Eq. (11)] should read:

$$n_k=n_0^{(0)}\lambda_{0k}(\lambda_{k\sigma}-\gamma\Delta H)^{-1}\times[\exp(-\gamma\Delta Ht)-\gamma\Delta H\lambda_{k\sigma}^{-1}\exp(-\lambda_{k\sigma}t)];$$

and Eq. (11) should read:

$$M_z-M_0=-\gamma\hbar n_0^{(0)}\{[1+\textstyle\sum_k\lambda_{0k}(\lambda_{k\sigma}-\gamma\Delta H)^{-1}]\times\exp(-\gamma\Delta Ht)-\gamma\Delta H\sum_k\lambda_{0k}\lambda_{k\sigma}^{-1}\times(\lambda_{k\sigma}-\gamma\Delta H)^{-1}\exp(-\lambda_{k\sigma}t)\}.$$

Spin and Parity of the ω Meson, M. L. STEVENSON, L. W. ALVAREZ, B. C. MAGLIĆ, AND A. H. ROSENFELD [Phys. Rev. **125**, 687 (1962)]. The following "Notes Added in Proof" were returned with galleys of this paper but did not appear in the published article:

NOTES ADDED IN PROOF

I. Is the G Parity of the ω Meson -1?

A. Dalitz Plot Evidence for $G=-1$

If the true width of the 3-pion resonance were consistent with zero, one might question whether the observed $\pi^+\pi^-\pi^0$ decay mode is an "allowed" transition.

Duerr and Heisenberg have suggested that our data are also consistent with $J=1^{++}$, 0^{-+} (the first superscript refers to the parity and the second to the G parity).[7] Both of these can give a uniformly populated Dalitz plot. They argue that our Dalitz plot might really be uniformly populated, but that measurement errors can depopulate the area near the boundary, making an originally flat distribution resemble that for a vector meson. Our counter argument is as follows: A flat Dalitz plot corresponds to an isotropic distribution of the vector $\mathbf{q}$ representing the breakup of the dipion. If we start with isotropy it is difficult for us to see how random errors can introduce anisotropy. This argument is supported by two experimentally flat Dalitz plots: (a) Our control region, as well as that of Xuong and Lynch,[2] shows no significant depopulation near the boundary. (b) An analysis of 1347 τ^- decays in flight shows that experimental errors do not depopulate the boundary of the Dalitz plot.[8]

For our data to fit a flat distribution, χ^2 is 93 where nine is expected. It would take a fluctuation of more than ten standard deviations to produce such a distribution, and so we conclude that its is definitely inconsistent with being flat.

B. Further Evidence Against 0^{-+} and 1^{++}

1. For the neutral-to-charged branching ratio of 0^{-+}, Duerr and Heisenberg predict $(\omega\rightarrow 3\pi^0)/(\omega\rightarrow\pi^+ +\pi^- +\pi^0)=\frac{3}{2}$. If this hypothesis were correct, we should be able to see the $3\pi^0$ decay mode in the reaction $\bar{p}+p\rightarrow 2\pi^+ +2\pi^- +3\pi^0$ as a peak of 45-Mev (experimental) half-width in the missing-mass distribution. We estimate that we would notice such a peak if it contained $\geqslant 50$ to 100 events. The same experiment that yielded over 1125 reactions (1) also yielded 76 ± 18 six-prong annihilations identified as $\bar{p}+p\rightarrow 2\pi^+ +2\pi^- +(\omega\rightarrow\pi^+ +\pi^- +\pi^0)$.[2] We should see $(3/2)(76\pm 18)=114\pm 25$ neutral decays in our 4-prong missing-mass peak. We find no evidence for such a large peak.

2. Additional evidence against 1^{++} comes from the absence of the 4-pion decay mode of the ω both in the 6-prong data of Xuong and Lynch[9] and in our 4-prong data. According to Duerr and Heisenberg this is an allowed decay mode and could compete with the electromagnetic 3-pion decay mode. We have also looked in vain for the $\pi^+ +\pi^- +\gamma$ decay mode of the ω.

The Dalitz plot, the absence of the $3\pi^0$ decay mode, and the absence of a 4-pion decay mode are strong evidence that the ω meson is 1^{--}.

II. Effect of the $T=1$, $J=1$ Pion-Pion Resonance on the Final States of the ω Decay

At the suggestion of Gell-Mann, we have included the effect of the $T=1$, $J=1$ pion-pion interaction on the final state of ω decay. The square of the matrix element for the 1^- meson is multiplied by the product of three resonant denominators of the form

$$(M_{ij}^2-M_\rho^2)^2+M_\rho^2\Gamma_\rho^2(M_{ij});$$

where

$$\Gamma_\rho(M_{ij})=\Gamma[(M_{ij}^2-4)/(M_\rho^2-4)]^{\frac{3}{2}}/(M_\rho/M_{ij}),$$

M_ρ is the mass of the resonance and Γ its width; ij is first $0+$, then $+-$, then -0; M_{0+} is the invariant mass of the $\pi^+\pi^0$ system, etc. For $M_\rho=5.37$ ($=750$ Mev) and $\Gamma=1$ ($=140$ Mev), this factor is 1.20 times larger at the center of the Dalitz plot than it is at point "a" in Fig. 1(E). Therefore, the $T=1$, $J=1^-$ pion-pion resonance does not seriously distort the matrix elements.

---

[2] N. H. Xuong and G. R. Lynch, Phys. Rev. Letters **7**, 327 (1961).

[7] H. P. Duerr and W. Heisenberg, "The Quantum Numbers of the ω Meson" (to be published).

[8] M. Ferro-Luzzi, D. H. Miller, J. J. Murray, A. H. Rosenfeld, and R. D. Tripp, Nuovo cimento **22**, 1087 (1961).

[9] N. H. Xuong and G. R. Lynch, Lawrence Radiation Laboratory (private communication).