

otic form for Eq. (A11):

$$\tan\delta_{l^{\pm}} \sim \alpha b_{l^{\pm}} x^{2l+1} [(2l+1)!!]^{-2} [1 - \alpha b_{l^{\pm}} (2l+1)^{-1}]^{-1}.$$

This same expression is obtained with the approximation  $\tan\delta_{l^0} = 0$  in Eq. (A11) (for  $x \ll l$ ). The numerator of this expression is just the Born approximation for the phase shifts when  $x \ll l$ , while the denominator is a correction term resulting from the distortion of the outgoing wave by the spin-orbit interaction. For  $l$  near to or less than  $X$  the  $\tan\delta_{l^0}$  term in Eq. (A11) must generally be treated in detail [as in Eq. (35)]. However, near a resonance in  $\tan\delta_{l^0}$  Eq. (A11) gives for  $x \ll l$

$$\tan\delta_{l^{\pm}} \sim -x^{2l+1} [1 + \alpha b_{l^{\pm}} (2l+1)^{-1}] \times \{\alpha b_{l^{\pm}} [(2l-1)!!]^2\}^{-1},$$

and the polarization can be appreciable. On the other hand, a resonance in  $\tan\delta_{l^{\pm}}$  occurs for  $x \ll l$  when

$$\tan\delta_{l^0} = -x^{2l+1} [1 - \alpha b_{l^{\pm}} (2l+1)^{-1}] \times \{\alpha b_{l^{\pm}} [(2l-1)!!]^2\}^{-1},$$

which splits the resonance energies for  $\tan\delta_{l^{\pm}}$ .

**New Measurements of  $\beta$ -Circularly-Polarized  $\gamma$  Angular-Correlation Asymmetry Parameters in Allowed  $\beta$  Decay,** L. G. MANN, D. C. CAMP, J. A. MISKEL, AND R. J. NAGLE [Phys. Rev. **137**, B1 (1965)]. A recent re-examination of our Co<sup>58</sup> source showed Co<sup>60</sup> impurity which amounted to about 2% of the total activity at the time of the original measurements. Another recently acquired source for which the specifications indicated <0.01% Co<sup>60</sup> shows a similar 2% contamination. Since the polarimeter is much more sensitive to the radiations from Co<sup>60</sup> than to those from Co<sup>58</sup>, this impurity introduced about a 10% error in our measurement of the  $\beta$ - $\gamma$  (circularly-polarized) asymmetry parameter of Co<sup>58</sup>. Correcting for the Co<sup>60</sup>, the result in Table V should read  $A = -0.185 \pm 0.011$  instead of  $-0.213 \pm 0.012$  for Co<sup>58</sup>. The corresponding values for  $|M_F|$  and the isospin impurity coefficient  $\alpha$  are  $(0.9 \pm 0.6) \times 10^{-3}$  and  $(0.34 \pm 0.21) \times 10^{-3}$ , respectively. These results now agree very well with the nuclear alignment data.

**Consistency Conditions on the Strong Interactions Implied by a Partially Conserved Axial-Vector Current,** STEPHEN L. ADLER [Phys. Rev. **137**, B1022 (1965)]. In Eqs. (16) and (23),

$$[(p_{10}/M)(p_{20}/M)2k_0]^{1/2}$$

should be

$$[(p_{10}/M)(p_{20}/M)2q_0]^{1/2}.$$

**Theory of the Electronic Thermal Conductivity of Superconductors Containing Paramagnetic Impurities,** LEONARD W. GRUENBERG [Phys. Rev. **138**, A78 (1965)]. In Eq. (II.24), the right-hand side of each equation should be multiplied by  $\frac{1}{4}$ .

Equation (III.9) should read

$$\kappa_s/\kappa_n = \frac{\omega_0}{\pi^2 kT} (\alpha^{-2/3} - 1) \times \{1 + (\Gamma_{tr}^+)^{-1} [2\Gamma^M (\alpha^{-2/3} - 1) + 2\Gamma^{M'}]\}^{-1} e^{-\beta\omega_0},$$

where  $\alpha = 2\Gamma^M/\Delta$ .

In Eq. (III.10),  $\tau^+$  should be replaced by  $\tau_{tr}^+$ .

The denominator of the first term on the right-hand side of Eq. (III.4) should be squared.

Taking note of the identity  $T_2^2 + T_3 T_4 = 0$ , we see that our Eq. (II.26) is identical to Eq. (2.47) of Ambegaokar and Griffin.<sup>1</sup> On the other hand, our results in Sec. IIIC differ strikingly from theirs. This is because we have looked at the limiting case  $\Gamma^N \approx 0$  while they assume  $\Gamma^N \gg \Gamma^M$ . We believe that for the case of Gd in very pure La,  $\Gamma^N \ll \Gamma^M$  and hence our results apply.

If  $\Gamma^N > kT_c$ , the Boltzmann equation does not give the correct limiting value for  $\kappa_s/\kappa_n$  for temperatures near  $T_c$ .

We would like to thank Dr. A. Griffin for his illuminating comments.

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<sup>1</sup> V. Ambegaokar and A. Griffin, Phys. Rev. **137**, A1151 (1965).

**Further Evidence for Pignotti's R Trajectory,** ROGER J. N. PHILLIPS AND WILLIAM RARITA [Phys. Rev. **138**, B723 (1965)]. In Eq. (1) interchange the right-hand sides of lines (3) and (4).

**Ground-State Properties and Low-Lying States of the N<sup>14</sup> Nucleus,** NAZAKAT ULLAH AND R. K. NESBET [Phys. Rev. **134**, B308 (1964)]. In carrying out a detailed configuration interaction calculation, an error was found in the computer program used to compute radial integrals. On repeating the numerical calculation with the corrected program, it turns out that the approximate Hartree-Fock binding energy is only one-third of its experimental value. The rms radius is, as before, in fair agreement with its experimental value, the quadrupole moment has the correct sign, but the magnetic dipole moment is too large by a factor of 2. The excitation energy of the low-lying state  $J^\pi = 1^+$ ,  $T = 0$  is now in good agreement with its experimental value.

The corrected Tables III and IV, giving the new parameters and results of the approximate Hartree-

Fock self-consistent-field calculation, are :

TABLE III. Parameters  $n_i, \gamma_i$  for the  $s$  and  $p$  radial wave functions under equivalence restriction.

$i$	$l_i$	$n_i$	$\frac{\gamma_i}{(F^{-2})}$
1	0	0	0.173
2	0	1	0.173
3	0	2	0.173
4	1	0	0.182
5	1	1	0.182
6	1	2	0.182

TABLE IV. One-nucleon energies  $\epsilon_a$  and the coefficients  $X_i^a$  for orthonormal self-consistent-field occupied orbitals  $\phi_a$  of  $N^{14}$  under equivalence restriction.

$\phi_a$	$\epsilon_a$ (MeV)	$X_1^a$	$X_2^a$	$X_3^a$
1s	-41.14	1.19917	-0.32988	0.09638
1p	-14.54	1.25181	-0.49250	0.26846

The matrix elements of the  $3 \times 3$  ground-state configuration have the following values:

$$H_{aa} = -33.724, \quad H_{ab} = 0.996, \quad H_{ac} = 0.643, \\ H_{bb} = -33.926, \quad H_{bc} = 2.831, \quad H_{cc} = -36.625.$$

The diagonalization of this matrix gives the eigenvalues:

$$\epsilon_1 = -38.412, \quad \epsilon_2 = -34.358, \quad \epsilon_3 = -31.506.$$

The eigenvector belonging to the lowest eigenvalue is given by:

$$X_a = 0.00273, \quad X_b = 0.53328, \quad X_c = -0.84593.$$

Thus the approximate Hartree-Fock binding energy of  $N^{14}$  is 38.41 MeV compared with an experimental value of 104.21 MeV. Also, the first excited  $J^\pi = 1^+, T = 0$  state now lies at 4.05 MeV above the ground state.

The rms radius  $(\langle r^2 \rangle)^{1/2}$  is now 2.35 F and the magnetic dipole moment  $\langle \mu \rangle$  has the value 0.85 nuclear magneton. The electric quadrupole moment  $\langle Q \rangle$  has the value 0.53 eF<sup>2</sup>.

The power of  $-1$  in both Eqs. (13) and (14) should be  $l_a - m_a + \frac{1}{2}$ . In Eq. (18) the power of  $-1$  should be  $m_a - \frac{1}{2}$ , and a factor  $[(2l_a + 1)(2l_b + 1) \times (2j_a + 1)(2j_b + 1)]^{1/2}$  should be inserted.

**$\pi^+p$  Interactions at 4 GeV/c, AACHEN-BERLIN-BIRMINGHAM-BONN-HAMBURG-LONDON (I.C.)-MÜNCHEN COLLABORATION** [Phys. Rev. **138**, B897 (1965)]. In Fig. 37 the numbers on the right-hand side of the vertical scales, indicating the values of  $d\sigma/d\Delta^2$ , should all be divided by ten.

**Artificial Singularity in the Multichannel  $ND^{-1}$  Equations of the New Strip Approximation**, SHU-YUAN CHU [Phys. Rev. **137**, B409 (1965)]. The Wiener-Hopf operator  $O_l(s, s')$  introduced in Sec. II, when both  $s$  and  $s'$  tend to the strip boundary  $\sigma$  simultaneously, has the behavior

$$O_l(s, s') \underset{s, s' \rightarrow \sigma}{\propto} \frac{\left(\frac{\sigma-s}{\sigma-s'}\right)^a - \left(\frac{\sigma-s'}{\sigma-s}\right)^a}{s'-s},$$

and correspondingly is not square integrable. Thus the simple prescription we gave is not valid unless all  $\lambda_{ij}$  with  $i \neq j$  vanish. The reader should disregard the previous argument, starting with Eq. (III.2), and consider instead the following. Subtracting out the singular part of Eq. (III.1) down to the highest threshold  $s_M$ , we have

$$N_i(s) = B_i(s) + \int_{s_M}^{\sigma} U_{i\mu}(s, s') N_\mu(s') ds' \\ + \int_{s_M}^{\sigma} K_{i\mu}(s, s') N_\mu(s') ds' - \lambda_{i\mu} \int_{s_M}^{\sigma} k(s, s') N_\mu(s') ds' \\ \text{for } i=1, \dots, n. \quad (\text{III.2}')$$

Then we define functions  $N_i^0$  through the following equations:

$$N_i(s) = N_i^0(s) - \lambda_{i\mu} \int_{s_M}^{\sigma} k(s, s') N_\mu(s') ds' \\ \text{for } i=1, \dots, n. \quad (\text{III.3}')$$

Now consider the  $\lambda_{ij}$  as elements of an  $n \times n$  matrix  $\Lambda$ . Let  $S$  be the orthogonal matrix which diagonalizes  $\Lambda$  (since  $\Lambda$  is real and symmetric,  $S$  always exists); i.e.,

$$S\Lambda S^{-1} = \Lambda^D S^{-1} = S^T,$$

where  $\Lambda^D$  is a diagonal matrix:

$$\Lambda_{ij}^D = e_i \delta_{ij} \quad \text{for } i, j = 1, \dots, n.$$

From (III.3') we then have

$$S_{i\mu} N_\mu = S_{i\mu} N_\mu^0 - S_{i\mu} \lambda_{\mu\nu} S^{-1}_{\nu\rho} S_{\rho\tau} k N_\tau,$$

or

$$\bar{N}_i = \bar{N}_i^0 - e_i \int_{s_M}^{\sigma} k \bar{N}_i \quad \text{for } i=1, \dots, n, \quad (\text{III.4}')$$

where

$$\bar{N}_i = S_{i\mu} N_\mu, \\ N_i^0 = S_{i\mu} N_\mu^0;$$