

and three-dimensional "crystals" and Peierls¹ established that such order persists only in three-dimensional crystals above the absolute zero of temperature. In the appendix to our paper we have demonstrated only that the relative atomic fluctuations remain finite, consistent with the thermodynamic stability of the chain (see also Frenkel²).

We are grateful to Professor Peierls and Professor Domb for discussions and correspondence on this topic.

¹ R. Peierls, *Helv. Phys. Acta* **81**, Suppl. 2 (1936).

² J. Frenkel, *Kinetic Theory of Liquids* (Clarendon Laboratory, Oxford, 1946), pp. 120-124.

Decay of Ti⁵¹ and Cr⁵¹, M. E. BUNKER AND J. W. STARNER [Phys. Rev. **97**, 1272 (1955)]. In regard to paragraph III(d), one of the comparison factors used in the calculation of α_T was in error by a factor of 2.0. The corrected value is $\alpha_T = (1.62 \pm 0.16) \times 10^{-3}$.¹ On the basis of this result, the K conversion coefficient is calculated to be $\alpha_K = 1.47 \times 10^{-3}$. The two nearest theoretical conversion coefficients² are $\beta_K^1 = 1.1 \times 10^{-3}$, and $\alpha_K^2 = 3.8 \times 10^{-3}$. The 323-keV transition therefore appears to be $M1 + E2$ with the $E2$ component having an intensity of $\sim 13\%$.

¹ This value compares favorably with that recently reported by Z. O'Friel and A. H. Weber, *Phys. Rev.* **99**, 659(A) (1955); private communication. Their result is $\alpha_T = (1.48 \pm 0.2) \times 10^{-3}$.

² Rose, Goertzel, Spinrad, Harr, and Strong, *Phys. Rev.* **83**, 79 (1951); Rose, Goertzel, and Swift (privately circulated tables).

Spin-Echoes with Four Pulses—An Extension to n Pulses, T. P. DAS AND D. K. ROY [Phys. Rev. **98**, 525 (1955)]. In this paper, the trigonometric parts of the amplitudes obtained by us for the echoes $P_{(12)}$, and the set $P_{(13)}$, $P_{(23)}$, $P_{((12)3)}$, $P_{(123)}$ (corresponding respectively to the primary echo produced by the first pair of pulses and the four secondary echoes produced by the first three pulses), are in disagreement with earlier values deduced by Hahn¹ and Das and Saha.² Our amplitudes are given in Table I together with those

TABLE I. Trigonometric part of amplitudes of several echo terms.

Term	Our amplitude	Hahn's amplitude
$P_{(12)}$	$\frac{1}{4} \sin^2 \xi \cos^2(\xi/2)$	$\sin \xi \sin^2(\xi/2)$
$P_{(13)}$	$\frac{1}{4} \sin^2 \xi \cos^2(\xi/2)$	$\frac{1}{4} \sin^2 \xi$
$P_{(23)}$	$\frac{1}{4} \sin^2 \xi$	$\sin \xi \sin^2(\xi/2)$
$P_{((12)3)}$	$-\frac{1}{4} \sin^2 \xi \sin^2(\xi/2)$	$\sin \xi \sin^4(\xi/2)$
$P_{(123)}$	$\frac{1}{2} \sin^2 \xi \sin^2(\xi/2)$	$\frac{1}{2} \sin^2 \xi$

of the earlier workers for comparison ($\xi = \omega_1 t_w$, t_w being the width of the rf-pulse and $\omega_1 = \gamma H_1$, where H_1 is the amplitude of the rf field during the applied pulse).

The cause of this disagreement is briefly as follows: In Hahn's analysis (see our paper and reference 1), to find the primary echo amplitude, only a single pair of pulses is applied and averaging³ over $\Delta\omega$, η , and ϕ is done after the second pulse. Similarly for the secondary echoes, three pulses are applied and the averaging is done after the third pulse. In our paper, we were more interested in the echoes that follow after the fourth pulse. We therefore collected all the terms contributing to the V -component (the Y -component in the rotating¹ system) of the nuclear magnetization, after the fourth pulse and then averaged over $\Delta\omega$, η , and ϕ . This gives the amplitudes of the echoes following the fourth pulse correctly but not those of the primary and secondary echoes produced by only the first two and the first three pulses respectively, as these echoes have their maxima before the fourth applied pulse (under the assumed condition $\tau_3 > 2\tau_2$), and only their tails remain after their fourth pulse (of course these tails cannot be seen because the echoes are limited to a width $1/T_2^*$ by the field inhomogeneity). If we are interested in the primary and secondary echo amplitudes we must therefore apply the averaging procedure to the terms contributing to V , after the second and third pulses respectively, when we get Hahn's result. We cite a similar disagreement between the two values obtained by Hahn⁴ for the free-induction signal following the first pulse in the two cases when he analyzes the patterns following one and two pulses. He obtains the values $\sin \xi$ and $\sin \xi \cos^2(\xi/2)$ respectively, of which the former is the correct one.

¹ E. L. Hahn, *Phys. Rev.* **80**, 580 (1950).

² T. P. Das and A. K. Saha, *Phys. Rev.* **93**, 749 (1954).

³ The symbols have the same significance as in reference 2.

⁴ Refer to Eqs. (16) and (17) of reference 1.

Energy Levels of Li⁶ from the Deuteron-Helium Differential Cross Sections, A. GALONSKY AND M. T. McELLISTREM [Phys. Rev. **98**, 590 (1955)]. On page 598, second column, line 9, the definition of the Coulomb phase shift should read " $\alpha_l = \text{Coulomb phase shift} = 2[\arctan \eta + \arctan(\eta/2) + \dots + \arctan(\eta/l)] \dots$ " instead of " $\alpha_l = \text{Coulomb phase shift} = 2\arctan(\eta + \eta/2 + \dots + \eta/l) \dots$ ".

Special-Relativistic Derivation of Generally Covariant Gravitation Theory, ROBERT H. KRAICHNAN [Phys. Rev. **98**, 1118 (1955)]. Equation (11) should read:

$$\mathfrak{D}^{\sigma\tau}(f) = |\eta|^{\frac{1}{2}} D^{\sigma\tau}(f) = \dots \quad (11)$$

instead of

$$\mathfrak{D}^{\sigma\tau}(f) = |\eta|^{\frac{1}{2}} \mathfrak{D}^{\sigma\tau}(f) = \dots$$