ERRATA

Andrei *et al.* Reply: E. Y. ANDREI, G. DEVILLE, D. C. GLATTLI, F. I. B. WILLIAMS, E. PARIS, and B. ETIENNE [Phys. Rev. Lett. **62**, 973 (1989)].

Several changes and omissions made during the production of the Reply rendered the originally printed version self-contradictory and confusing. The errors are such that they could not be rectified by an Erratum of the usual form, and therefore the Reply is reproduced below in its entirety.

Andrei *et al.* Reply: In the preceding Comment, Stormer and Willett[1] (SW) wish to explain our recent observations on the magnetically induced Wigner solid (MIWS)[2] in terms of surface acoustic waves (SAW) of the host lattice. But our experimental observations rule out this idea.

The SAW spectrum is independent of temperature, electric and magnetic fields because the interaction with the electrons has no frequency dependence in the range of measurement. By contrast we have observed a large shift of the resonance pattern with temperature and magnetic field as well as a smooth shift upon application of a "backgate" potential (applied between the back of the sample and the electron gas). Furthermore, in order to observe well defined resonances, our experiment requires samples with zero-field mobility in excess of 10^6 cm^2 V^{-1} s^{-1} and low densities $n_s \lesssim 10^{11}$ cm^{-2}. This exceeds by far what is required for observing SAW which, given the appropriate experimental arrangement, can be detected[3] in samples with moderate mobility 5×10^5 cm^2 V^{-1} s^{-1}, and high density $n_s \gtrsim 3\times10^{11}$ cm^{-2}.

SW question our fit of resonance positions to a $f \sim q^{3/2}$ law, and suggest a linear fit instead, in support of their SAW hypothesis. While our data do not exclude it, the linear fit is less satisfactory, since it indicates a SAW propagation velocity of $v_{\mathrm{SAW}} = 2.1\times10^5$ cm/sec compared with the independently measured value of 3×10^5 cm/sec for our crystal orientation[3]; in our analysis, the equivalent quantity is the shear propagation velocity for which the fit gives 5.05×10^6 cm s^{-1} compared with a value of 4.45×10^6 cm s^{-1} calculated for the asymptotic limit $B \rightarrow \infty$, where it reduces to the classical value.

Misunderstanding may have arisen from the way SW read our raw spectra. They note that the 80-mK section of our Fig. 2 shows a regular structure on the high-frequency side, but they take no account of the lower-frequency absorption feature which is about 4 times as intense. To understand how to read the raw signal we recall that the demodulated signal is the derivative of the transmitted rf power with respect to backgrate potential which acts via the electrons; the variation produced arises through the direct electronic absorption $\sim \sigma E^2$, where $\sigma = \sigma(q,f)$ is the electronic conductivity at wave vector q and frequency f and $E = E(q,f)$ is the exciting field. The physics is in $\sigma(q,f)$, whose extraction requires a knowledge of E. But, at the high end of our frequency range, E had a nonmonotonic frequency dependence as a result of imperfections in the spectrometer (reflections due to impedance mismatches). The undemodulated transmitted power showed structure which coincides exactly with the wiggles in question. Their persistence in the demodulated signal indicates that σ has a nonzero derivative with respect to backgate potential. What is significant is the broadening of the envelope, its zero crossing with frequency, and the shift of the centroid to lower frequency as $B \rightarrow B_c^+$. So interpreted, the signal gives resonance frequencies which fall rather sharply as $B \rightarrow B_c^+$. This translates into a field dependence of the shear modulus $\mu(B)$ [via $f \propto \mu^{1/2}(B)/B$] as expected for a MIWS.[4] In the SAW interpretation, however, the frequencies are independent of field, again showing its inadequacy.

Indeed, by design, our experiment is insensitive to SAW since it cannot measure it directly, but the absorption it induces in the meander transmission line via the electron layer. This indirect coupling involves twice the small piezoelectric coupling coefficient[3] $a = 6\times10^{-4}$, firstly in the excitation of the SAW by the meander line and secondly in the power absorbed by the electrons. The result is an absorptivity in the line of $A_{\mathrm{SAW}} \lesssim 10^{-6}$, to be compared with an estimated (and observed) absorptivity due to direct interaction on resonance with the lower hybrid mode of a MIWS of $A \lesssim 10^{-2}$. The signal-to-noise ratio for observing SAW in our experiment is thus $\sim 10^{-2}$, 4 orders of magnitude below that of MIWS. The former is unobservable under our conditions,[5] the latter quite observable and, we believe, the observed signal.

We conclude that the resonances are not surface acoustic waves and that the most natural interpretation which fits the ensemble of our data is that we detect the lower hybrid mode of a magnetically induced Wigner solid.

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[1] H. L. Stormer and R. L. Willett, preceding Comment [Phys. Rev. Lett. **62**, 972 (1989)].

[2] E. Y. Andrei, G. Deville, D. C. Glattli, F. I. B. Williams, E. Paris, and B. Etienne, Phys. Rev. Lett. **60**, 2765 (1988).

[3] A. Wixforth, J. P. Kotthaus, and G. Weimann, Phys. Rev. Lett. **56**, 2104 (1986).

[4] K. Maki and X. Zotos, Phys. Rev. B **28**, 4349 (1983).

[5] Typical values of incident power (10 pW), detector noise temperature (300 K), bandwidth (10 Hz), and the observed linewidths are used for the estimates.

Model for Quasi-One-Dimensional Antiferromagnets: Application to CsNiCl$_3$. IAN AFFLECK [Phys. Rev. Lett. **62**, 474 (1989)].

In the equation on p. 474, replace "$\frac{1}{2}g$" by "$1/2g$."

On p. 475, third line in the first column below the two-column equation, replace "$(2s\phi)^{1/2}$" by "$(2s)^{1/2}\phi$."

On p. 476, second column, seventeenth line, replace "$\mathbf{k}=\pm\mathbf{k}_2$" by "$\mathbf{k}=\mathbf{0}$."

Difficulties with a Local Quantum Field Theory of Possible Violation of the Pauli Principle. O. W. GREENBERG and R. N. MOHAPATRA [Phys. Rev. Lett. **62**, 712 (1989)].

The two lines immediately preceding Eq. (6) should read ". . . Young tableau (3,1) with three boxes in the first row and one box in the second row. The state $a^\dagger b^\dagger a^{\dagger 2}|0\rangle$ overlaps (3,1); its norm squared is . . . ."

Comment on "Ordering and Criticality in Spin-1 Chains." IAN AFFLECK [Phys. Rev. Lett. **62**, 839 (1989)].

In the sixth line below the second equation replace "the variation of λ" by "varying λ."

In the seventh line from the last paragraph replace "$\lambda-1$" by "$\lambda=1$."

Pseudoquasicrystals: Quasicrystal-like Crystals with Thirteen to Eighteen Strong Electron Scatterers Per Unit Cell. TIN-LUN HO and YING-HONG LI [Phys. Rev. Lett. **62**, 917 (1989)].

In footnote 12, p. 920, the sentence "Assuming . . . has 1105 atoms . . . on the average" should read "Assuming . . . has 110 atoms . . . on the average."

On p. 920, first column, fourth line, the sentence "it is dangerous to base solely on ED the identification of the . . ." should read "it is dangerous to base solely on ED to identify the . . . ."

Two Theorems on the Hubbard Model. ELLIOTT H. LIEB [Phys. Rev. Lett. **62**, 1201 (1989)].

On p. 1202, second paragraph, the sentence "Still more accurately, ferromagnetism . . . ," should read, "Still more accurately, ferrimagnetism . . . ."

On p. 1203, Eq. (4) should read,

$$KW+WK+\sum_x U_x L_x W L_x = eW\,.$$