# Errata

## Erratum: Crystalline order in two dimensions [Phys. Rev. 176, 250 (1968)]

N. D. Mermin

The argument makes use of functions $\phi_i(\vec{r})$ which vanish on the edges of the region $R$ given by

$$\vec{r} = x_1 N_1 \vec{a}_1 + x_2 N_2 \vec{a}_2, \quad 0 \le x_1, x_2 \le 1 \ .$$

The functions $\sin(\vec{k}\cdot\vec{r})$ are asserted to have this property if $\vec{k}$ has the form

$$\vec{k} = n_1 \vec{b}_1 / N_1 + n_2 \vec{b}_2 / N_2, \quad \vec{b}_i \cdot \vec{a}_j = 2\pi\delta_{ij} \ .$$

This is manifestly false.

The argument can be repaired by replacing the choice of $\phi$ given in Eq. (9) with

$$\phi = \sin(\vec{k}_1\cdot\vec{r}) \sin(\vec{k}_2\cdot\vec{r}) \ ,$$

where

$$\vec{k}_1 = n_1 \vec{b}_1/N_1, \quad k_2 = n_2 \vec{b}_2 / N_2 \ .$$

Subsequent steps in the argument must be modified in various details, but with one exception the necessary modifications are quite apparent. The final conclusions on crystalline order in two dimensions remain unchanged.

The only step in the revised argument that might not be immediately evident is the construction of the upper bound for the quantity $[\phi(\vec{r}_i) - \phi(\vec{r}_j)]^2$. This can be extracted from the identity

$$\begin{aligned}\sin A \sin B - \sin C \sin D = {} & 2\sin\tfrac{1}{2}(A+C)\cos\tfrac{1}{2}(A-C)\sin\tfrac{1}{2}(B-D)\cos\tfrac{1}{2}(B+D) \\ & + 2\sin\tfrac{1}{2}(A-C)\cos\tfrac{1}{2}(A+C)\sin\tfrac{1}{2}(B+D)\cos\tfrac{1}{2}(B-D) \ .\end{aligned}$$

This gives

$$\begin{aligned}[\sin(\vec{k}_1\cdot\vec{r}_i)\sin(\vec{k}_2\cdot\vec{r}_i) - \sin(\vec{k}_1\cdot\vec{r}_j)\sin(\vec{k}_2\cdot\vec{r}_j)]^2 & \le 4\{|\sin[\vec{k}_1\cdot\tfrac{1}{2}(\vec{r}_i - \vec{r}_j)]| + |\sin[\vec{k}_2\cdot\tfrac{1}{2}(\vec{r}_i - \vec{r}_j)]|\}^2 \\ & \le |\vec{k}_1\cdot(\vec{r}_i - \vec{r}_j)|^2 + |\vec{k}_2\cdot(\vec{r}_i - \vec{r}_j)|^2 \\ & \le (k_1^2 + k_2^2)(\vec{r}_i - \vec{r}_j)^2 \ .\end{aligned}$$

Since

$$k_1^2 + k_2^2 = Ak^2 \ ,$$

where $A$ is a constant depending on the vectors $\vec{a}_1$ and $\vec{a}_2$, this bound gives the quadratic $k$ dependence essential for the argument.

I am indebted to Sudip Chakravarty and Chandan Dasgupta for calling this mistake to my attention.

## Erratum: Foundations of a comprehensive theory of liquid $^4$He [Phys. Rev. B 19, 2556 (1979)]

H. W. Jackson

The following changes are needed to correct typesetting errors: The top line in the first column of page 2577 should be removed; it should be inserted as the top line in the first column of page 2583.

 