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Corrections to the geometrical interpretation of bosonization[1]
MANFRED STEINER, BRAD MARSTON, Brown University — Bosonization is a powerful approach for understanding certain strongly-correlated fermion systems, especially in one spatial dimension but also in higher dimensions[2]. The method may be interpreted geometrically in terms of deformations of the Fermi surface, and the quantum operator that effects the deformations may be expressed in terms of a bilinear combination of fermion creation and annihilation operators. Alternatively the deformation operator has an approximate representation in terms of coherent states of bosonic fields[3]. Calculation of the inner product of deformed Fermi surfaces within the two representations reveals corrections to the bosonic picture both in one and higher spatial dimensions. We discuss the implications of the corrections for efforts to improve the usefulness of multidimensional bosonization.

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[2]A.Houghton, H.-J. Kwon and J. B. Marston, Adv. in Phys. **49**, 141 (2000).
[3]A. H. Castro Neto and E. Fradkin, Phys. Rev. B **49**, 10877 (1994).

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