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Vortex-Phonon Interaction in the Kosterlitz-Thouless Theory EVGENY KOZIK, NIKOLAY PROKOF'EV, BORIS SVISTUNOV, University of Massachusetts Amherst — The "canonical" variables of the Kosterlitz-Thouless theory– fields $\Phi_0(\mathbf{r})$ and $\phi(\mathbf{r})$, generally believed to stand for vortices and phonons (or their XY equivalents, like spin waves, etc.) turn out to be neither vortices and phonons, nor, strictly speaking, *canonical* variables. The latter fact explains paradoxes of (i) absence of interaction between Φ_0 and ϕ , and (ii) non-physical contribution of small vortex pairs to long-range phase correlations. We resolve the paradoxes by explicitly relating Φ_0 and ϕ to canonical vortex-pair and phonon variables.

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