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Interference of a stack of coupled two-dimensional BEC pancakes DAVID PEKKER, VLADIMIR GRITSEV, EUGENE DEMLER, Harvard University — We study the superfluid-normal transition in a stack of Josephson coupled two-dimensional BEC pancakes. Using a combination of the Renormalization Group and the self-consistent harmonic approximation we look at the transition from Kosterlitz-Thouless type behavior to 3D XY type behavior in this finite sized system. We compute the form of the interference patterns that can be observed experimentally if the gas is allowed to expand. In particular, we concentrating on the amplitude modulations in the direction normal to the two-dimensional pancakes, i.e. the direction of fastest expansion.

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