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**Detecting statistics of quasiparticles using dynamical probes**  
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Boston University — We study a time-dependent sine-Gordon model in the range of the coupling constant (Luttinger parameter) where the quasiparticle excitations change from massive bosons to free fermions. We find that, if we include the effects of finite temperature, the non-adiabatic response to slow perturbations is enhanced for the bosonic case and reduced for the fermionic one with respect to zero temperature. The signature of this *bunching* (*anti-bunching*) behaviour can also be seen at zero temperature by analyzing the second order corrections of a perturbative approach in the number of quasiparticles created. This suggests the existence of a crossover (for the Luttinger parameter) that separates systems with bose-like statistics from systems with fermi-like statistics, and therefore time-dependent perturbations to the system can be used to probe the statistics of the quasiparticles. We show how this model is relevant for cold atoms experiments that realize splitting and merging of two one-dimensional bose gases.

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