

Crossover

between two extreme limits depending on pair size ξ

BCS (“fermionic”)

$$n \xi^3 \gg 1$$

BEC (“bosonic”)

$$n \xi^3 \ll 1$$

□ Theoretical Issues on the Crossover... II

1. Observability

➤ Normal vs. Superfluid State

Signatures of S-state: transverse probes (see MIT experiment!)

Signatures of N-state: (pseudo)gap (Innsbruck, JILA,...)

Collective exc.: only if collisional regime known (Innsbruck, Duke,...)

➤ Bose-Einstein Condensation vs. Superfluidity

Interactions make n_c differ from ρ_s

Phase-coherence probes

➤ Dynamics vs. Thermodynamics [(non)equilibrium]

Role of dynamical effects in the formation of the pairs (ENS, Innsbruck, Duke, JILA)