Three-body losses and thermodynamics of a unitary Bose gase

Séminaire du groupe atomes froids

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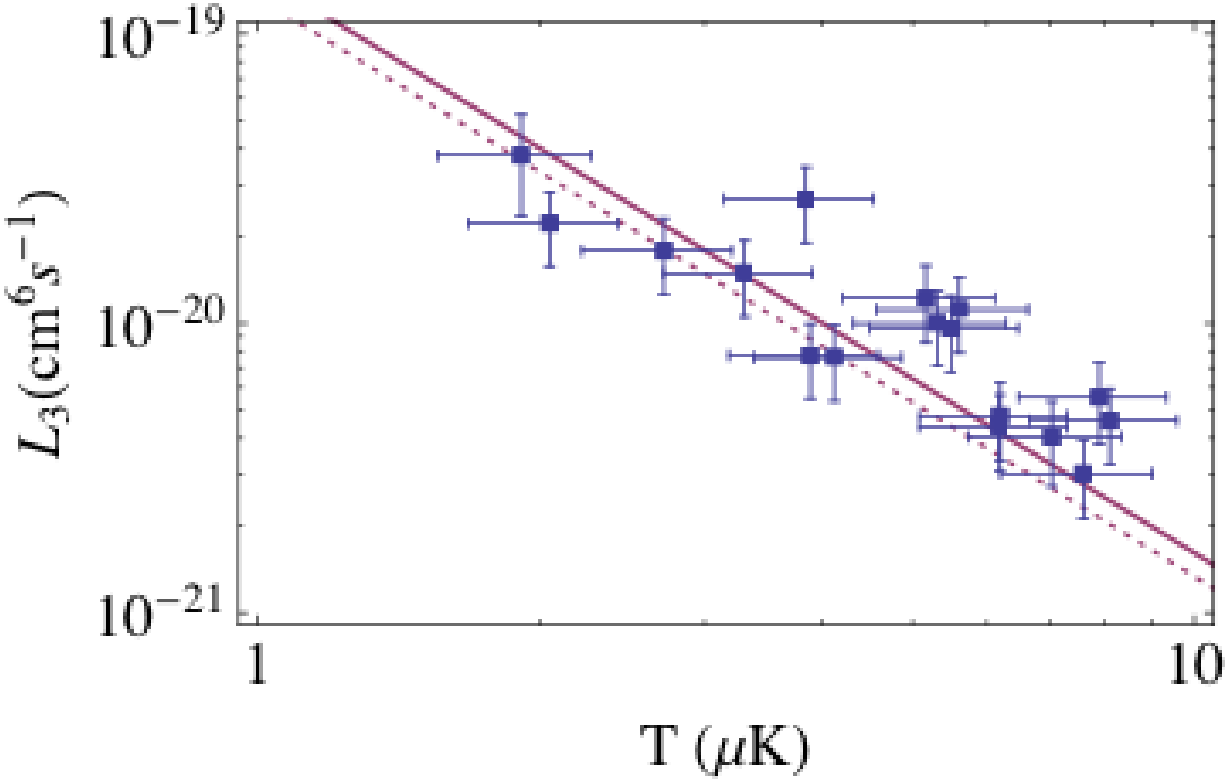
Previously

- Is there such a thing as a unitary Bose gas?
- *Partial answer*: yes, at high temperature

$$\dot{N} = -L_3 n^2 N$$

$$L_3 \sim \frac{\hbar^5}{m^3 (k_B T)^2}$$



What can be seen at high temperature?

- Virial coefficients!

$$\Xi = \sum_N e^{N\beta\mu} Z_N$$

Z_N: partition function of the N-body problem

Z_1: 1 particle, ideal gas

Z_2: 2 particles, first correction to the ideal gas

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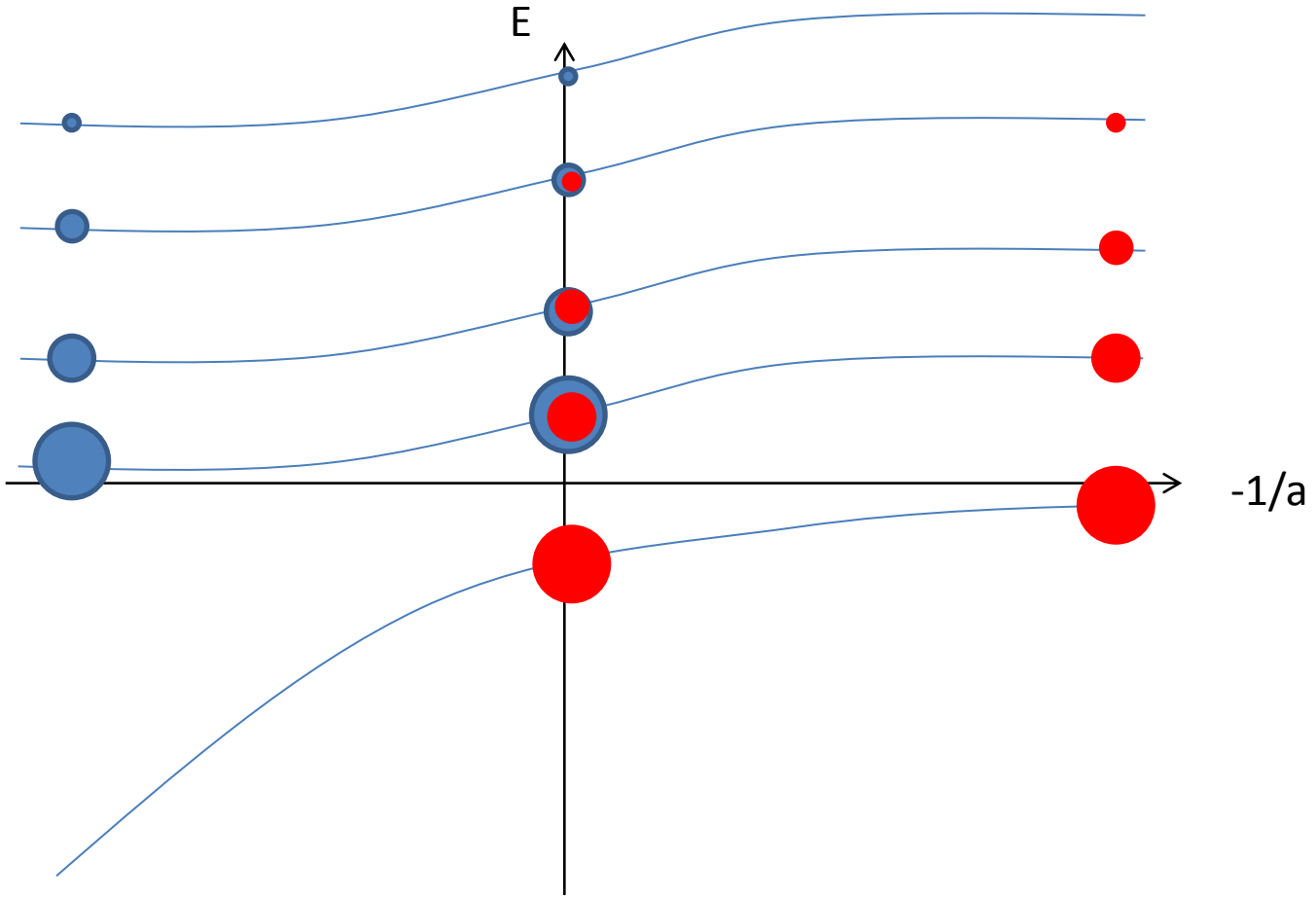
« Calculation » of Z_2



Discontinuity of Z_2 between the « attractive » and « repulsive » branches

At large temperature, losses are small but interactions are weak too. Is it possible to see unadulterated interaction effects in the high temperature unitary Bose gas?