

Abstract Submitted  
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**Superfluid properties across the BEC/BCS transition<sup>1</sup>** JACQUES TEMPERE, JOZEF DEVREESE, Universiteit Antwerpen — The superfluid properties of a Bose-Einstein condensate (BEC) and of the Bardeen-Cooper-Schrieffer (BCS) state are reasonably well understood. Recent experimental breakthroughs allow investigating the transition region between the BEC and BCS limits. In this contribution, we apply the path-integral formalism to study how the vortex core size, the superfluid critical velocity and the pair-pair scattering length vary in the crossover region. These quantities depend on the interaction strength of the atoms and change quantitatively from BEC to BCS side. In particular we discuss how the pair-pair scattering length obtained here relates to the mean-field results and to the four-body scattering result.

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