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Occupation Statistics of a Bose-Einstein Condensate in a Driven Double Well Potential[1] K. SMITH-MANNSCHOTT, Wesleyan University, Middletown, CT; MPI for Dynamics and Self-Organization, Goettingen, Germany, M. CHUCHEM, Ben-Gurion University, Beer-Sheva, Israel, M. HILLER, Physikalisches Institut, Albert-Ludwigs-Universitaet, Hermann-Herder-Str. 3, Germany, T. KOTTOS, Wesleyan University, Middletown, CT; MPI for Dynamics and Self-Organization, Goettingen, Germany, D. COHEN, Ben-Gurion University, Beer-Sheva, Israel — We consider the occupation statistics $P_t(n)$ of a Bose-Einstein condensate consisting of N particles loaded in a double-well trap with intersite coupling K. Two dynamical scenaria are investigated: a) wavepacket dynamics and b) linear variation of the bias between the onsite energies of the two wells. In the latter case, we resolve three different behaviors as we increase the driving rate for intermediate values of the interatomic interaction $K/N < U < NK$: quantum adiabatic, diabatic, and sudden regime. We find that during the adiabatic to diabatic crossover, many-body Landau-Zener transitions play a dominant role, resulting in oscillations of the second moment of the occupation statistics. In contrast, the crossover to the sudden regime is characterized by a broad distribution $P_n(t \to \infty)$ which is reflected in a global maximum of the second moment.

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