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Numerical study of two-body correlation in a 1D lattice with perfect blockade BO SUN, FRANCIS ROBICHEAUX, Auburn University — We investigate the correlation properties in frozen Rydberg gases driven by an external laser. Due to the well-known dipole blockade, pair excitation within the so-called blockade radius is greatly suppressed. This gives us the motivation to partition the whole gas into smaller pieces which we term "pseudoatoms". Each pseudoatom can then be treated as a two-level system, initially in the ground state. By adopting a simplified model where pair excitation within a finite range is perfectly blocked, we compute the dynamics of excitation and two-body correlation in a 1D lattice. We find that two-body quantum correlation drops very fast with the distance between pseudoatoms. However, the total correlation does not show such fast drop with distance. This implies that there is no long range order in such systems.

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