# New interpretation of the reduced density matrices

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In this talk I give a new interpretation of reduced density matrices based on the set of excitations of a system. The first step is to show that these sets of excitations are isomorphic to the wave functions and form a Hilbert space a new parametrization of the two-body reduced density matrices based on a pair of anti-commutation matrices (ACMPs) which are isomorphic to the wave function.

This new formalism has the possibility to reduce the complexity of the $N$-representability conditions and the calculation of the total energy by using a number in $\mathcal{O}\left(n^4\right)$ parameters. I will show where I am in the implementation using SDP optimization.