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## Ikegai Tu 15 Programming Manual

Category: Ikegai then an explicit off-diagonal matrix product state is constructed for each of these configurations,  $SX_j$ ,  $SY_j$ ,  $SZ_j$ , etc. and the corresponding matrix product operators,  $SW_j$ , are then the diagonal projections of the full product states,  $|\Psi\rangle$ , onto the DMRG subspace. This is much faster than the direct method but, as previously discussed, this does not ensure that a large enough number of states will be kept in the DMRG subspace. These many orthogonal states are built from as few as  $m-1 = 4$  auxiliary sites using this modified construction technique, thereby ensuring that the number of required states are kept within the DMRG subspace. As a final note, it should be emphasized that the diagonalization method described in this paper can be applied to any DMRG algorithm that uses static Vidal operators to construct the MPS. [10] P. Jordan, J. von Neumann, and E. Wigner, [On an algebraic generalization of the quantum mechanical formalism], Ann. Math. [35], 29 (1934). B. Schumacher, [Sending entanglement through noisy quantum channels], Phys. Rev. A [51], 2738 (1995). A. Peres, [Separability Criterion for Density Matrices], Phys. Rev. Lett. [77], 1413 (1996). M. Horodecki, P. Horodecki, and R. Horodecki, [Separability of mixed states: necessary and sufficient conditions], Phys. Lett. A [223], 1 (1996). K. Zyczkowski, P. Horodecki, A. Sanpera, and M. Lewenstein, [Volume of the set of separable states], Phys. Rev. A [58], 883 (1998). M. Horodecki, P. Horodecki, and R. Horodecki, [Mixed-state entanglement and distillation: is there a 'bound' entanglement in nature?], Phys. Rev. Lett



