TikZ tensor network diagrams

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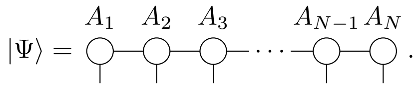
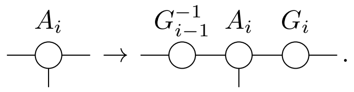
21 November 2025

Finite MPS:



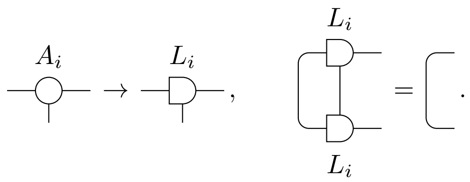
(1)

Gauge transform:



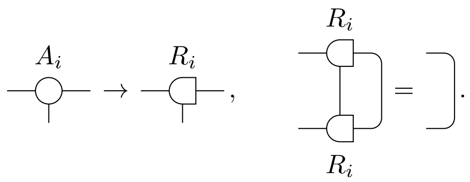
(2)

Left-orthogonal form:



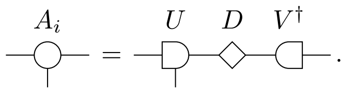
(3)

Right-orthogonal form:



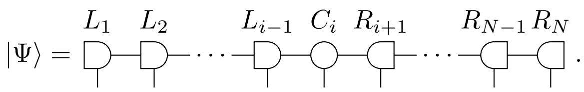
(4)

SVD:

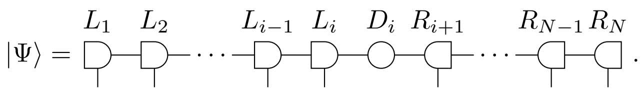


(5)

Mixed-canonical form:

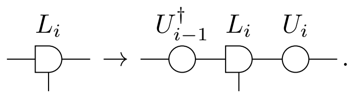


(6)



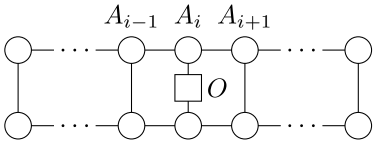
(7)

Unitary gauge transformation:

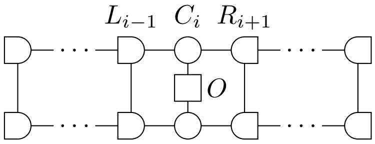


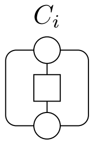
(8)

Expectation value:

$$\langle\Psi|O_i|\Psi\rangle =$$ 

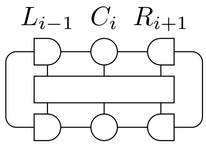
$$. \tag{9}$$

$$\langle\Psi|O_i|\Psi\rangle =$$ 

$$=$$ 

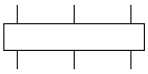
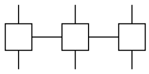
$$. \tag{10}$$

Multi-site expectation value:

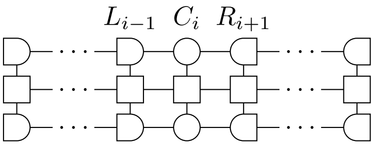
$$\langle\Psi|O|\Psi\rangle =$$ 

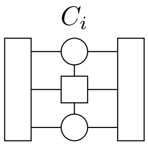
$$. \tag{11}$$

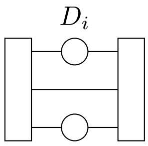
MPO:


$$=$$ 
$$. \tag{12}$$

MPO expectation value:

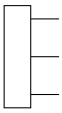
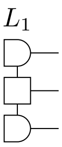
$$\langle\Psi|H|\Psi\rangle =$$ 

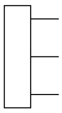
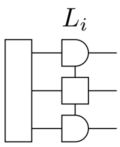
$$= E_{i-1}$$ 

$$F_{i+1} = E_i$$ 

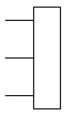
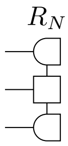
$$F_{i+1}\,. \tag{13}$$

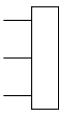
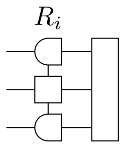
Environment tensors:

$$E_1$$ 
$$\equiv$$ 

$$, \qquad E_i$$ 
$$\equiv E_{i-1}$$ 

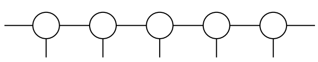
$$. \tag{14}$$


$$F_N \equiv$$ 

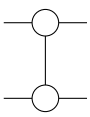
$$, \qquad$$ 
$$F_i \equiv$$ 

$$F_{i+1}\,. \tag{15}$$

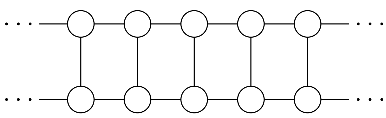
iMPS:

$$|\Psi\rangle = \cdots$$ 
$$\cdots. \tag{16}$$

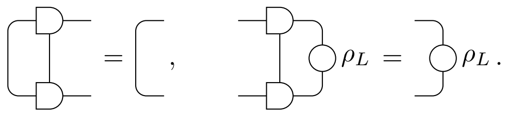
Transfer matrix:

$$T =$$ 
$$. \tag{17}$$

MPS norm:

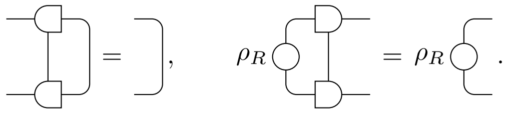
$$\langle\Psi|\Psi\rangle =$$ 
$$. \tag{18}$$

Left-orthogonal form:



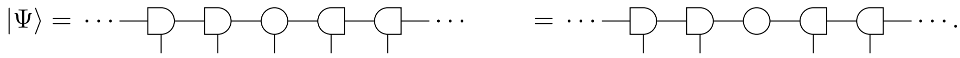
(19)

Right-orthogonal form:



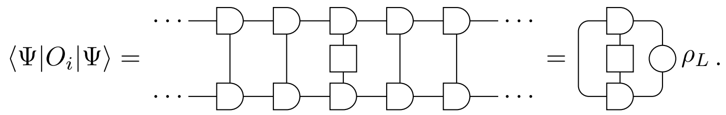
(20)

Mixed-canonical form:

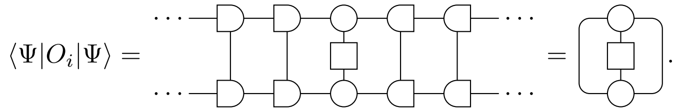


(21)

iMPS expectation value:

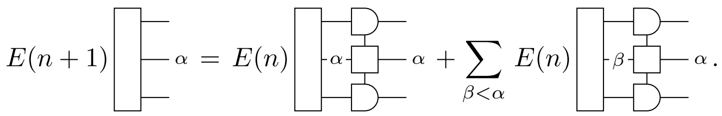


(22)



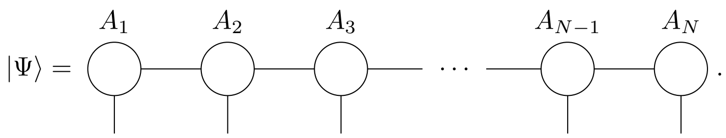
(23)

Environment tensor recursion relation:

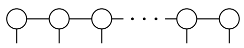


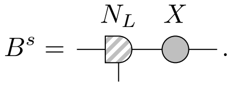
(24)

Big diagram:



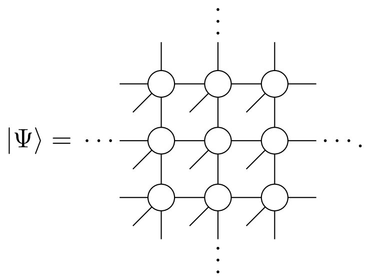
(25)

Inline diagram: $|\Psi\rangle =$ . % Patterns for tensors:



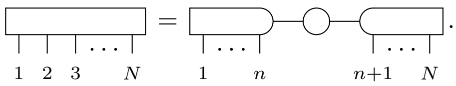
(26)

iPEPS:



(27)

Schmidt decomposition:



(28)