

Hao Shi

$$e^{-\tau \hat{H}} = e^{-\tau \hat{K}/2} e^{-\tau \hat{V}} e^{-\tau \hat{K}/2}$$

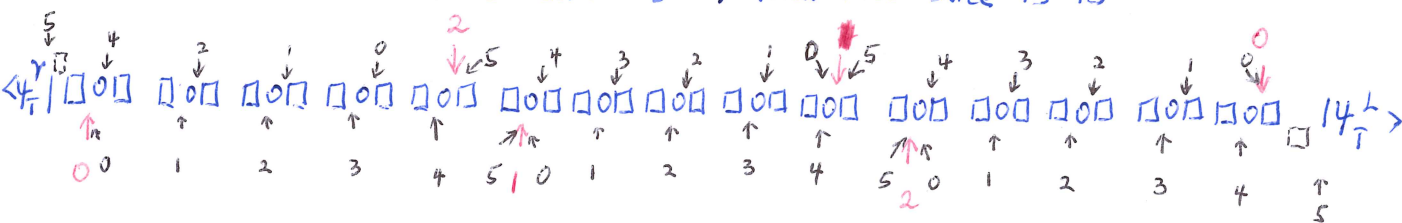
set: $e^{-\tau \hat{K}/2} = \square$, $e^{-\tau \hat{V}} = 0$

$$e^{-\tau \hat{H}} e^{-\tau \hat{H}} = e^{-\tau \hat{K}/2} e^{-\tau \hat{V}} \boxed{e^{-\tau \hat{K}/2} e^{-\tau \hat{K}/2} e^{-\tau \hat{V}}} e^{-\tau \hat{K}/2}$$

always apply $e^{-\tau k/2}$ $e^{-\tau k/2}$ $e^{-\tau v}$ together.

$$\square \circ \square \square \circ \square \square \circ \square \dots \square \circ \square \square \circ \square \square \circ \square \quad |Y_T\rangle$$

set blk_size = 5, blk_num = 3, total time slice is 15.



wf-blk-size is stored from 0~5. (black color), and 0, 5 is one blk_num wave function.

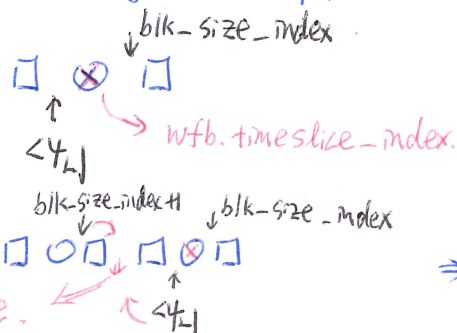
Diagram illustrating the merging process for the merge sort algorithm. It shows a sequence of 8 elements being merged into sorted sub-arrays. The elements are represented by boxes, some containing a cross. Arrows indicate the merging steps, and the final sorted sub-arrays are shown below the sequence.

Sequence of elements: $\boxed{5}$, $\boxed{4}$ (with cross), $\boxed{3}$ (with cross), $\boxed{2}$ (with cross), $\boxed{1}$ (with cross), $\boxed{0}$ (with cross), $\boxed{7}$ (with cross), $\boxed{6}$ (with cross).

Merging steps indicated by arrows: \uparrow , \rightarrow , \rightarrow , \rightarrow , \rightarrow , \uparrow .

Final sorted sub-arrays: $\langle 4, 1 \rangle \rightarrow \langle 4, 2 \rangle \rightarrow \langle 4, 3 \rangle \rightarrow \langle 4, 4 \rangle \rightarrow \langle 4, 5 \rangle$.

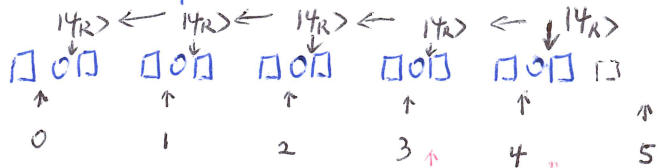
each time, during update_to_right_one_step, we have:



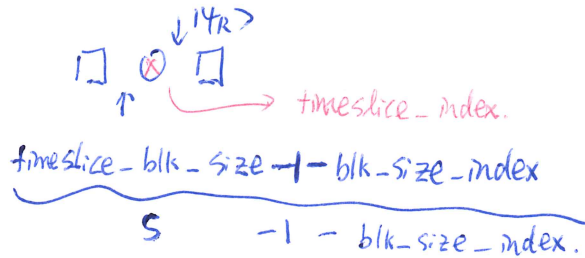
For measure.

⇒ always use $\lfloor \frac{n}{2} \rfloor$ and $\text{b/k-size_index}+1$ to measure.

* In one block, update to left.



during update to left one step.



measure here.

move $| \psi_R \rangle$ to right half step to measure.

* reweight.

$$| \psi_R' \rangle \leftarrow | \psi_R \rangle e^{-\tau_k} e^{-\tau_v}$$

$$\hat{|\psi_R\rangle} = e^{-\tau_k} e^{-\tau_v} | \psi_R \rangle$$

$$\hat{|\psi_R\rangle} = | \psi_R' \rangle \times \text{reweight.}$$

$$\langle \psi_L | \hat{|\psi_R\rangle} = \langle \psi_L | e^{-\tau_k} e^{-\tau_v} | \psi_R \rangle = \langle \psi_L | \psi_R' \rangle \times \text{reweight.}$$

only need to time is reweight if we want to move to next step.