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Time Evolution within a Comoving Window[1] MARTIN GANAHL, VALENTIN ZAUNER, TU Graz, TOMOTOSHI NISHINO, Kobe University, HANS GERD EVERTZ, TU Graz — We present a modification of Matrix Product State time evolution to simulate the propagation of a signal front on an infinite system. The time evolution is calculated within a finite window that moves along with the signal front, in such a way that boundary effects do not occur. Signal fronts can then be studied unperturbed for much longer times than on truly finite systems, where boundary perturbations and reflections would interfere. The entanglement within in the comoving window remains small. Our approach avoids the large entanglement which develops around the location of the signal source and therefore requires significantly lower computational effort. We verify our approach against exact results and show examples of propagating signals for the XXZ model and the transverse Ising model.

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