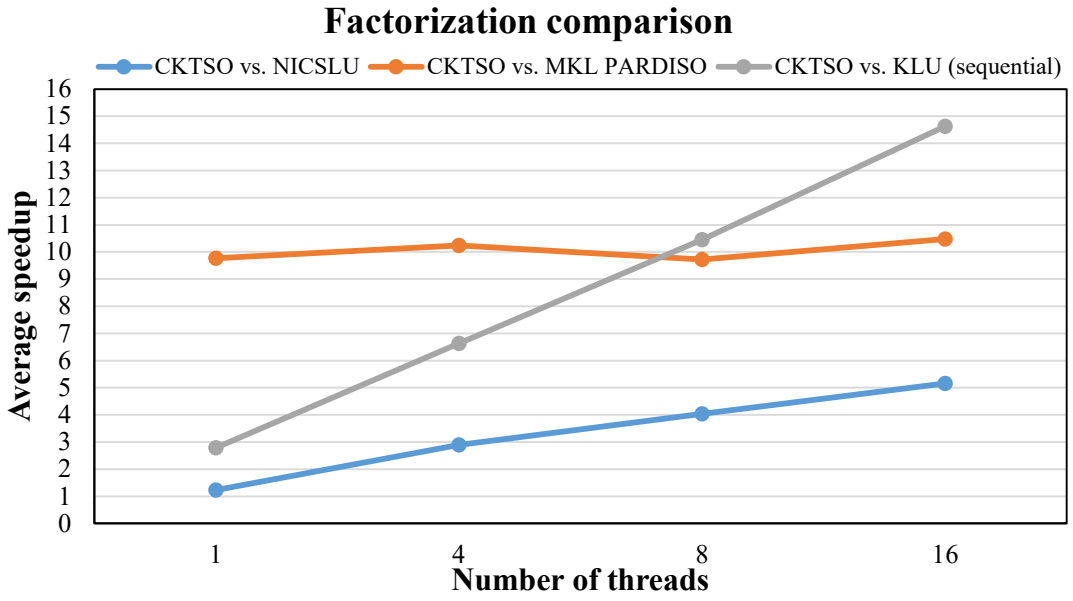
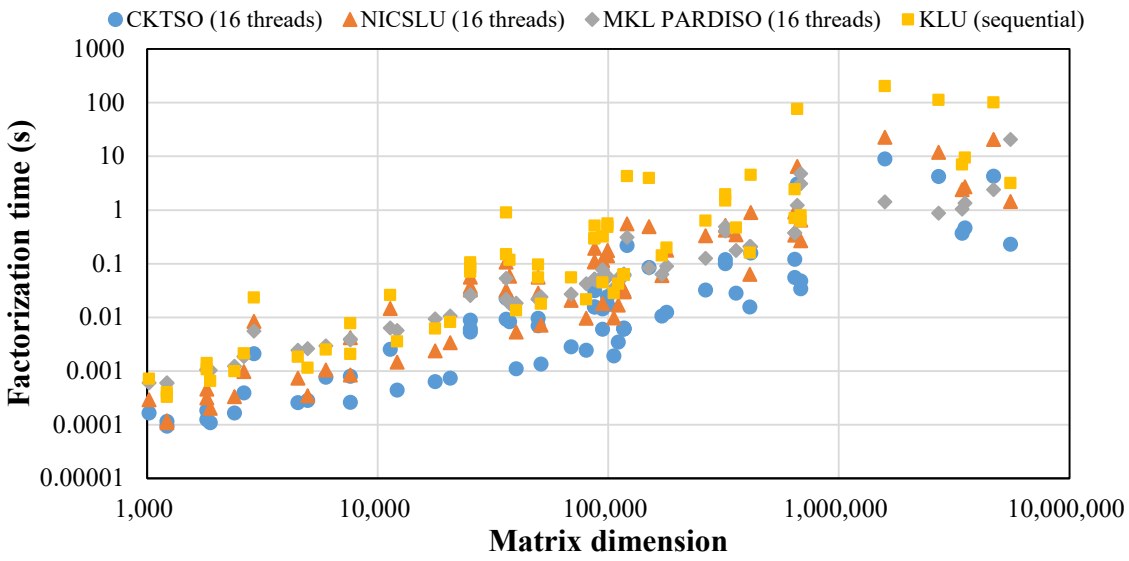
Results of CKTSO and Comparisons with Other Solvers

CKTSO (version 202205) is compared with NICSLU, Intel MKL PARDISO and KLU. The hardware and software configurations are listed in the following table. Note that KLU is purely sequential, and NICSLU does not have parallel solving. KLU uses the ordering results of NICSLU.

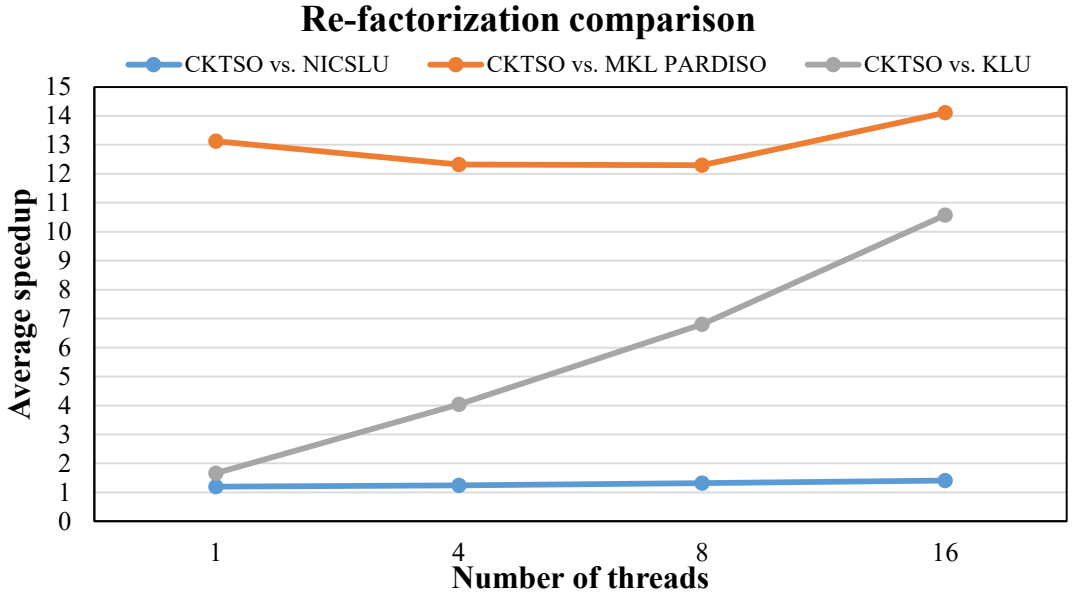
Operating system	CentOS 7.9.2009 x64
Compiler	gcc 4.8.5
CPU	Intel Xeon Gold 6130 (16 cores, 2.1GHz)
Memory	256GB
Benchmarks	66 circuit matrices from SuiteSparse Matrix Collection
Integer bitwidth	32 bits
Baselines	NICSLU version 202110, KLU version 1.3.9 and Intel MKL PARDISO version 2022.0.2

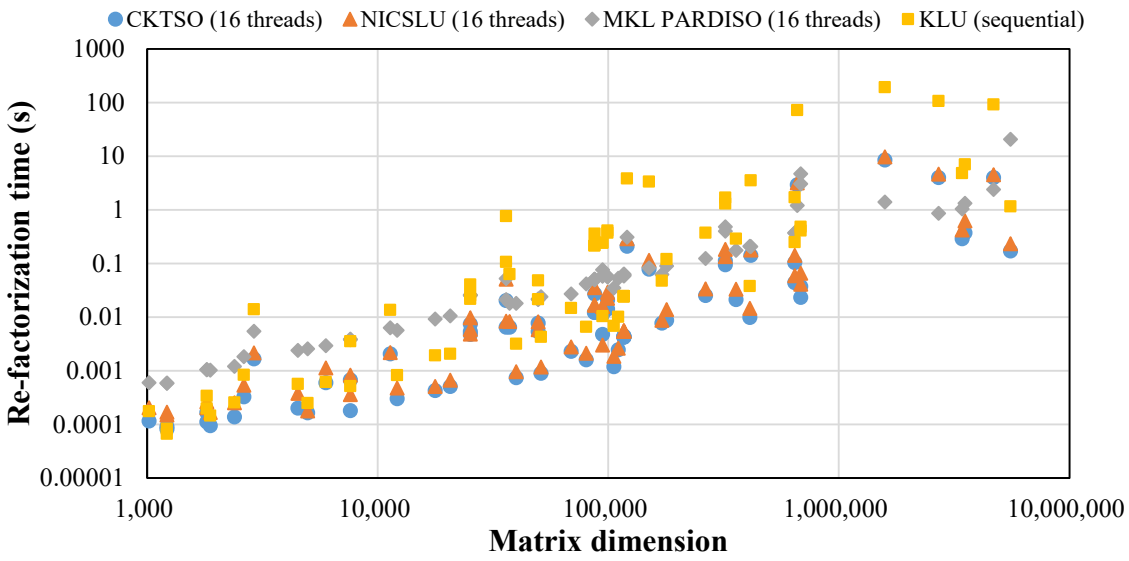
1. Factorization Performance



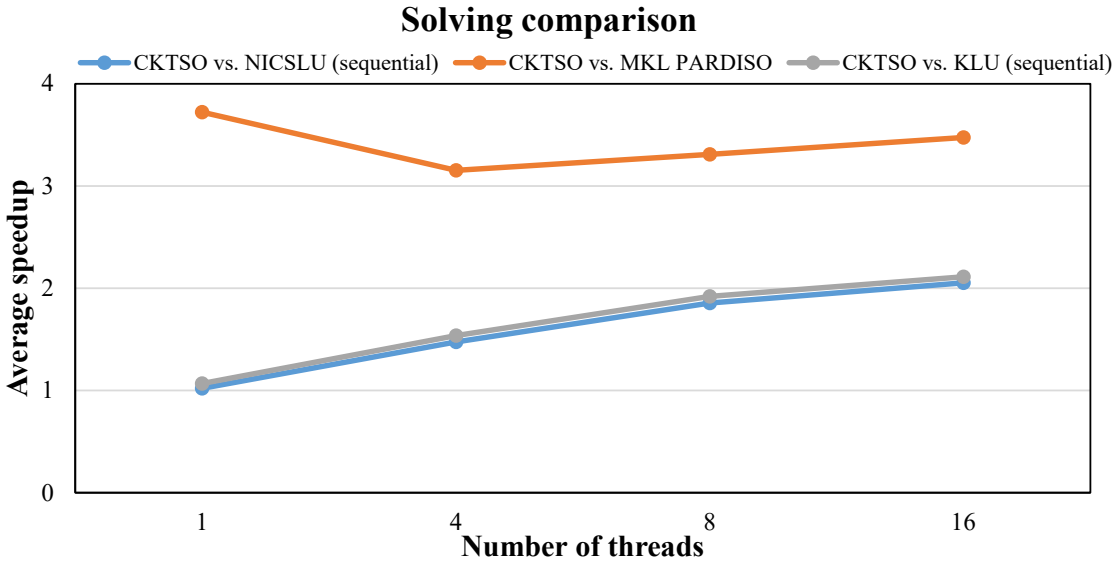


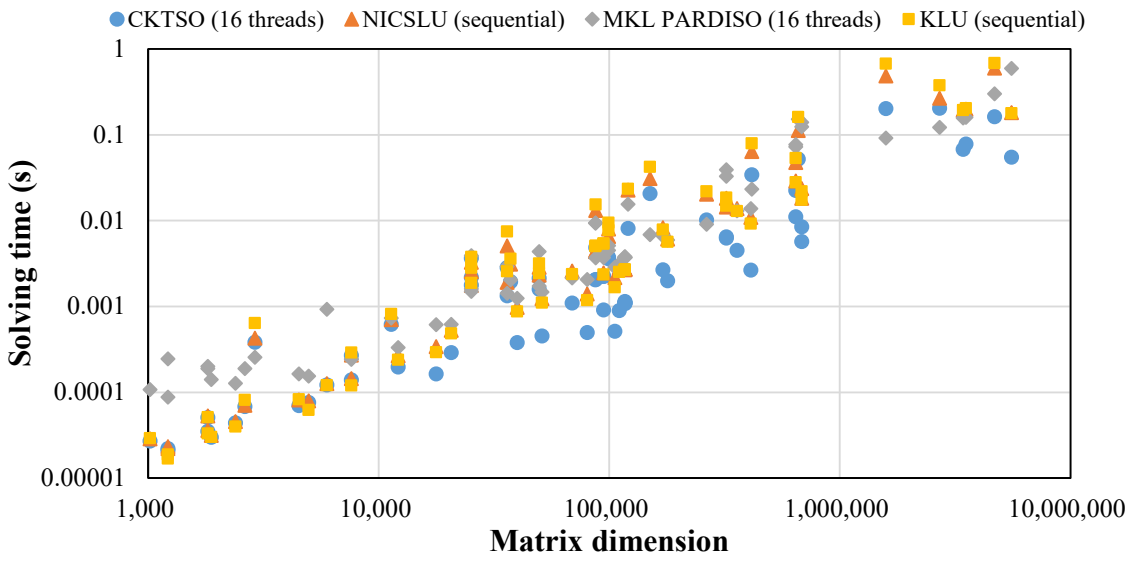
2. Re-factorization Performance





3. Solving Performance





4. Solution Accuracy

The L2-norm of the residual, i.e. $\|\boldsymbol{Ax} - \boldsymbol{b}\|_2$, is evaluated. CKTSO generates slightly small error than KLU and similar error to NICSLU. Compared with MKL PARDISO, CKTSO reduces error by 3.56X on geometric mean.

5. Memory Usage

Memory usage numbers are normalized to sequential CKTSO.