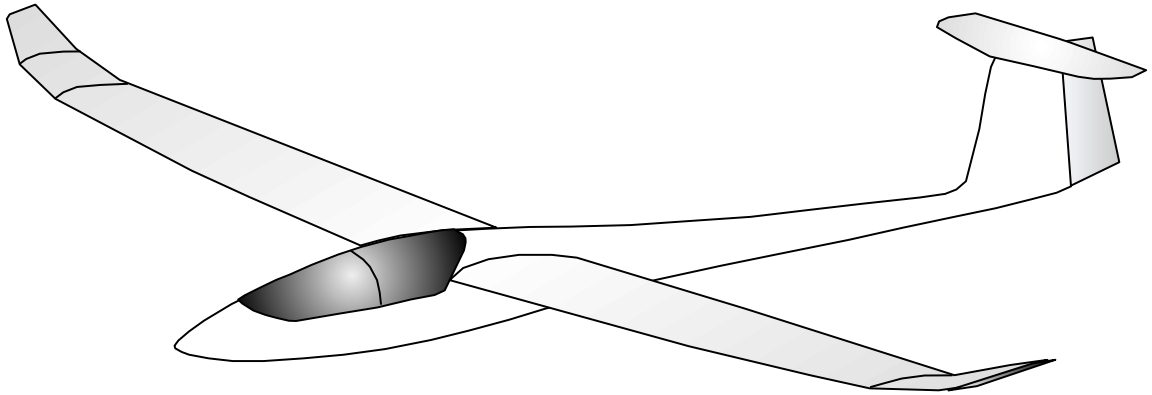
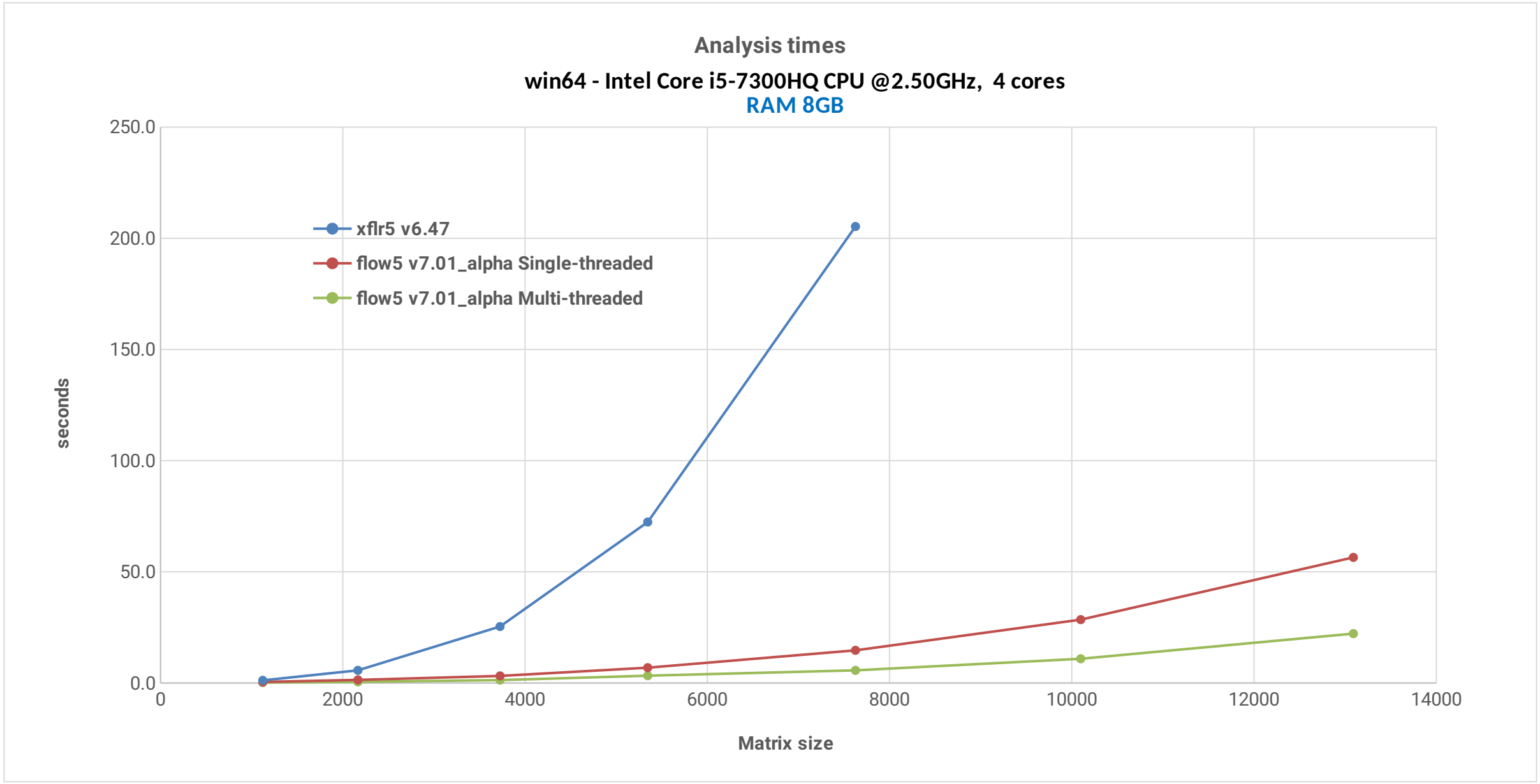


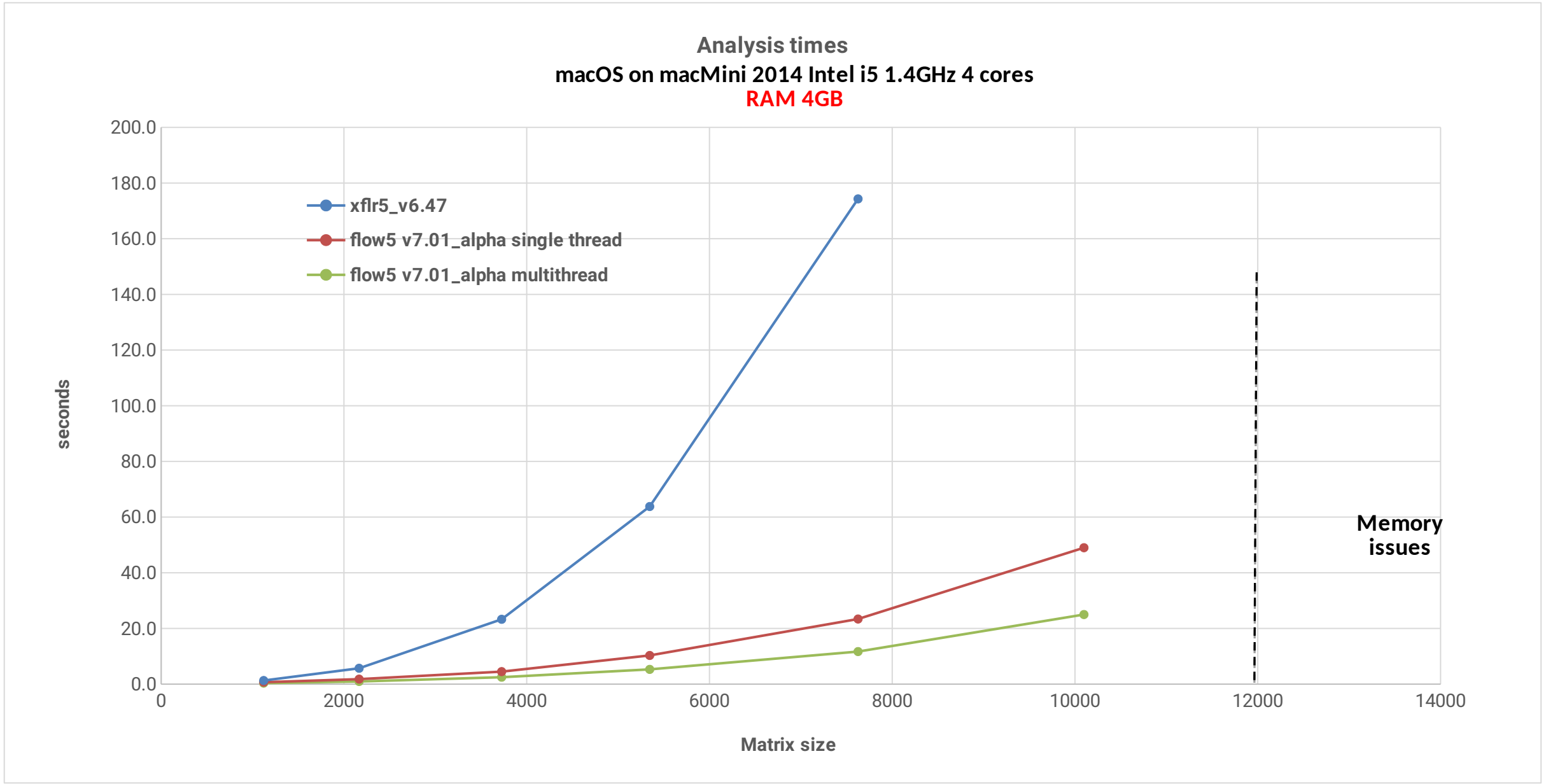
flow5

Linear systems, Analysis times, Intel MKL, Multi-threading

Intel’s Math Kernel Library

Intel's Math Kernel Library (Intel MKL) is a library of optimized math routines for science, engineering, and financial applications. Core math functions include BLAS, LAPACK, ScaLAPACK, sparse solvers, fast Fourier transforms, and vector math. The routines in MKL are hand-optimized specifically for Intel processors. The library supports Intel processors and is available for Windows, Linux and macOS operating systems.


Analysis times
win64 - Intel Core i5-7300HQ CPU @2.50GHz, 4 cores
RAM 8GB
xflr5 v6.47
flow5 v7.01_alpha Single-threaded
flow5 v7.01_alpha Multi-threaded
seconds
Matrix size
250.0
200.0
150.0
100.0
50.0
0.0
0
2000
4000
6000
8000
10000
12000
14000


Analysis times
macOS on macMini 2014 Intel i5 1.4GHz 4 cores
RAM 4GB
xflr5_v6.47
flow5 v7.01_alpha single thread
flow5 v7.01_alpha multithread
seconds
Matrix size
Memory issues
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
0
2000
4000
6000
8000
10000
12000
14000

Concluding notes

1. Although the MKL library should run on processors other than Intel's with comparable performance, please note that there is no guarantee from Intel that this will indeed be the case.
2. Unlike the LU decomposition in xflr5, the tasks performed by MKL cannot be interrupted. Be careful when requesting analyses with high mesh densities.