



Figure J.2 (a) Log-determinants of growing NTK submatrices from a ResNet9, with matrices formed in both 32-bit (red) and 64-bit (black) precision. Each point corresponds to the log-determinant of a matrix of size $m = nd$, with $d = 10$ and $n = 2^8, \dots, 2^{13}$. Solid curves denote results from MEMDET, while horizontal markers and vertical dashes indicate results from `numpy.linalg.eigh` and `numpy.linalg.slogdet`, respectively. Regardless of whether the NTK matrix was initially formed in 32-bit or 64-bit precision, all log-determinant computations were performed in 64-bit precision (as in all experiments in the manuscript). Within each matrix (32-bit or 64-bit), the three methods yield nearly identical log-determinants, with visible differences only arising between matrices formed in different floating-point formats. (b) Relative error of MEMDET and `eigh` compared to `slogdet` (used as the baseline) on the same matrix. Errors remain between 10^{-12} and 10^{-7} , with MEMDET generally achieving slightly higher numerical accuracy at larger scales compared to computing the log-determinant directly from eigenvalues.