

The graph displays the performance of different vectorization techniques across various input sizes, categorized into L1, L2, and L3 cache regions. The y-axis represents Performance in flops/cycle, ranging from 0 to 32. The x-axis represents Input Size  $n$ , where  $n$  is a power of 2, ranging from 4 to 22. The legend identifies the following techniques:

- Baseline (Blue line with circles)
- Optimized Inlined (Orange line with circles)
- O. I. Loop Unroll (LU) 8 (Green line with circles)
- AoS Vectorized (AVX2) (Red line with circles)
- AoS Vectorized Inlined (AVX2) (Purple line with circles)
- SoA Vectorized (AVX512) (Brown line with circles)
- SoA Vectorized S.I.C Inl. (AVX512) (Grey line with circles)
- SoA Vectorized LU 2 (AVX512) (Yellow line with circles)
- SoA Vectorized Inlined (AVX512) (Cyan line with circles)

The graph shows that the SoA Vectorized Inlined (AVX512) and SoA Vectorized LU 2 (AVX512) techniques achieve the highest performance, peaking around 24 flops/cycle in the L1 region and 14 flops/cycle in the L2 region. The SoA Vectorized S.I.C Inl. (AVX512) technique shows a steady performance of approximately 7 flops/cycle across the L1 and L2 regions. The other techniques show lower performance, generally below 4 flops/cycle.