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Vectorization with Haswell and CilkPlus ^[1]

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Project Specification: This project concerns the parallel computing and vectorization field for Physics Computing at CERN. The document summarises the results and experience from vectorization activities and an initial evaluation of the CilkPlus technology with two different benchmarks from CERN. Abstract: With the release of the Intel Sandy Bridge processor, vectorization ceased to be a ?nice to have? feature and became a necessity. This work is focused on optimization, running comparative measurements of available vectorization technologies currently under investigation by the CERN Concurrency Forum. In particular, the project involves an assessment of the limits of autovectorization in two compilers, an evaluation of CilkPlus as implemented in ICC/GCC and an evaluation of AVX/AVX2 benefits with respect to legacy SSE workloads.

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