

SAIP2014



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Affordable and power efficient computing for High Energy Physics: synthetic CPU performance and Fast Fourier Transform benchmarks of ARM processors.

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Abstract :

Modern Big Science projects such as the Large Hadron Collider at CERN generate enormous amounts of raw data which presents a serious computing challenge. After planned upgrades in 2022, the data output from the ATLAS Tile Calorimeter will increase by 200 times to over 40 Tb/s! ARM processors are common in mobile devices due to their low cost, low energy consumption and high performance and may be an affordable alternative to standard x86 based servers where massive parallelism is required. High Performance Linpack and CoreMark are used to test ARM Cortex-A7, A9 and A15 System on Chips CPU performance while their power consumption is measured. Comparisons are made between the ARM processors and an Intel i7-4770 CPU. In addition to synthetic benchmarking, the FFTW library is used to test the Fast Fourier Transform performance of the ARM processors and the results obtained are converted to theoretical data throughputs for a range of FFT lengths.

Award :

Yes

Level :

MSc

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Paper :

Yes

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