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# FAST PARALLELIZED TRACKING ALGORITHM FOR THE MUON DETECTOR OF THE CBM EXPERIMENT AT FAIR

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**Content** :

Particle trajectory recognition is an important and challenging task in the Compressed Baryonic Matter (CBM) experiment at the future FAIR accelerator at Darmstadt. The tracking algorithms have to process terabytes of input data produced in particle collisions. Therefore, the speed of the tracking software is extremly important for data analysis. In this contribution, a fast parallel track reconstruction algorithm which uses available features of modern processors is presented. These features comprize a SIMD instruction set and multithreading. The first allows to pack several data items into one register and to operate on all of them in parallel thus achieving more operations per cycle. The second feature enables the routines to exploit all available CPU cores and hardware threads. This parallelized version of the tracking algorithm has been compared to the initial serial scalar version which uses a similar approach for tracking. A speed up factor of 140 was achieved (from 630 msec/event to 4.5 msec/event) for an Intel Core 2 Duo processor at 2.26 GHz.

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