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## The Associative Memory system for the FTK processor at ATLAS

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Modern experiments search for extremely rare processes hidden in much larger background levels. As the experiment complexity, the accelerator backgrounds and luminosity increase we need increasingly complex and exclusive selections. We present results and performances of a new prototype of Associative Memory system, the core of the Fast Tracker processor (FTK). FTK is a real time tracking device for the Atlas experiment trigger upgrade.

The AM system provides massive computing power to minimize the online execution time of complex tracking algorithms. The time consuming pattern recognition problem, generally referred to as the “combinatorial challenge”, is beat by the Associative Memory (AM) technology exploiting parallelism to the maximum level: it compares the event to pre-calculated “expectations” or “patterns” (pattern matching) at once looking for candidate tracks called “roads”. The problem is solved by the time data are loaded into the AM devices. We report on the tests of the integrated AM system, boards and chips. The prototype has an impressive network of high speed, long serial links, successfully tested for their task solving the huge data distribution problem. We report also about the cooling tests and the expectations of power consumption of the system.

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