In order to improve the real time performance of the software receiver, a new parallel correlator is designed. It does not adopt a common look up table method, but uses bit wise based operating parallel algorithms and Single Instruction Multiple Data (SIMD) instruction set to optimize the operation of multiplication and summation of the correlator respectively. The new method can be adapted to various signal quantization bits, and its performance increases by 4 to 10 times than the existing algorithm. When tracking 12 channels GPS L1 signals, the new method uses less than 1% of the CPU occupied rate.

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实时GNSS软件接收机并行相关器设计

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Design of a Real Time GNSS Software Receiver Parallel Correlator

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