A fast constellation selection method named ' 3 SAT subset' is presented for reducing the large amount of computation when a sudden change occurs in the sky view in high accuracy GPS navigation system. The GDOP (Geometric Dilution of Precision) recursive formula is deduced by use of the Sherman Morrison formula to reduce matrix inversion operation. Moreover, efficient storage and search strategy of LLRB Tree (Left Leaning Red Black Tree) algorithm is used to assist rapid creation of optimal 4 SAT combinations and get the minimal GDOP. With respect to the traditional GDOP constellation selection, the amount of floating point operations per second (FLOPs) can be reduced by more than half when the number of visualization satellites increases, and almost equals 0 when the number decreases. The experimental results show that, 3 SAT subset method can effectively reduce the time consumption at the mutation of constellations and improve the real time performance accordingly.

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基于3星子集的GPS快速选星算法

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GPS Fast Constellation Selection Based on 3 SAT Subset

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