Abstract:

It was shown that the Vector Delay Lock Loop (VDLL) enhances the robustness of a GNSS receiver by exploiting the spatial correlation of the received signals. But due to the periodicity of the carrier, the VDLL only operates on the codephase and the carrier-frequency. In contrast to the VDLL, the Joint Tracking receiver manages to sustain the carrier-phase lock even in fast-changing, difficult environments. Other than the VDLL, the Joint Tracking algorithm doesn't estimate the receiver's location. The novel Position Domain Joint Tracking algorithm, described in this paper, combines both approaches, gaining from the advantages of both concepts. It is tested with signals generated by a constellation simulator, simulating a stationary and dynamic receiver. The test runs are discussed in terms of positioning performance. They show the big potential of such a combined receiver scheme as the signal synchronization is robust and the position estimate precise.

Stichworte: Kalman filters, delay lock loops, phase coding, receivers, satellite navigation