

Capacity Estimation of Hybrid Automated Repeat Request Protocol for Low Earth Orbit Mega-Constellations

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Abstract : Wireless communication chain requires effective ways to keep throughput efficiency high while it suffers location-dependent, time-varying burst errors. Several techniques are developed in order to assure that the receiver recovers the transmitted information without errors. The most fundamental approaches are error checking and correction besides re-transmission of the non-acknowledged packets. In this paper, stop & wait (SAW) and chase combined (CC) hybrid automated repeat request (HARQ) protocols are compared and analyzed in terms of throughput and average delay for the usage of low earth orbit (LEO) mega-constellations case. Several assumptions and technological implementations are considered as well as usage of low-density parity check (LDPC) codes together with several constellation orbit configurations.

Keywords : HARQ, LEO, satellite constellation, throughput

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