



Continuous-time quantized consensus: convergence of Krasovskii solutions

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This note studies a network of agents having continuous-time dynamics with quantized interactions and time-varying directed topology. Due to the discontinuity of the dynamics, solutions of the resulting ODE system are intended in the sense of Krasovskii. A limit connectivity graph is defined, which encodes persistent interactions between nodes: if such graph has a globally reachable node, Krasovskii solutions reach consensus (up to the quantizer precision) after a finite time. Under the additional assumption of a time-invariant topology, the convergence time is upper bounded by a quantity which depends on the network size and the quantizer precision. It is observed that the convergence time can be very large for solutions which stay on a discontinuity surface.

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