Title: Cooperative localization of underwater robots with unsynchronized clocks.

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Abstract: This presentation proposes an interval based approach for localizing underwater robots in a moving swarm using sonar communication. The originality of this presentation is to consider that the displacement of the robot while the sonar wave is moving is superior to the precision of the localization. Therefore we cannot suppose that we measure a true distance between robots at the same time, but between robots at different times. Moreover we'll consider the clocks of the robots to be unsynchronized so the emitting and receiving times of the wave are uncertain.

Therefore the object of this presentation is to deal with intertemporal constraints on uncertain times. The principle will be to cast the linear and non-linear state equations into a constraint satisfaction problem for which interval propagation is particularly powerful. The resulting propagation method will be illustrated in a simulation.