

Interference - modeling, processing, what else?

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Abstract:

Interference from other users is an importantly limiting factor in several types of communication situations like ad hoc networks or cognitive radio. Some strategies like virtual MIMO or multiuser detectors try to consider other users as information to limit (or suppress) their impact. However this is not always possible or necessitates difficult synchronization tasks or important signaling exchanges. Interference alignment tries to put interference in a space orthogonal to the signal. Once again, this can be difficult to implement in some situations.

In this TD we will discuss how to model the multiple access interference. An accurate model allows to implement robust signal processing solutions to improve performance or reduce the energy consumption of communication systems. The alpha-stable distributions are good candidates for such a model. At the beginning of this new action, this TD is a presentation of the alpha-stable approach and a comparison with alternative solutions. We will present what we can do with such models (derive BER or outage probabilities). We will also propose some strategies to improve the decoders or decision making at the receiver side or the impact on cooperative communication. We will then raise some unsolved problems that can be a starting point for joint works. In conclusion, the impact on green communication will finally be raised.