EUROPEAN COOPERATION
IN THE FIELD OF SCIENTIFIC
AND TECHNICAL RESEARCH

EURO-COST

IC1004 TD(16)02041
Durham, UK
October 4-6, 2016

SOURCE: Univ. Lille, CNRS, UMR 8520 - IEMN, Lille, France
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Impulsive noises and dependence - preliminary considerations

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Abstract - Following works presented in IC1004, we propose in this TD some further considerations about solutions for modeling dependence in impulsive noises. We use the copula framework that allows to reprensent, for instance, the upper and lower tail dependencies that can not be captured by classical correlation (which, besides, is not adapted to alpha-stable distributions). To illustrate the copula approach we consider a receiver architecture. The noise is modeled as a bivariate dependent Cauchy noise. If the copula represents the dependence structure we can derive the likelihood ratio that exhibits two components: one from the marginals and one from the copulas. We can then illustrate the impact of the dependence structure on the decision regions and we show that ignoring this dependence at the receiver side can importantly degrade the system performance.

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