

# LÉVY COPULAS

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How can we simulate the Lévy process? The main results are done with known density function of the Lévy process, such as Compound Poisson process, IG, GIG and other. Another results use series representation.

If we extend the space to more then one dimension we have a problem if the process has dependence between the spaces.

We want to focus on  $n$ -dimensional cases. As a starting point we take copulas and Lévy copulas.

**Definition 1** (Sklar). A  $n$ -copula is a function  $C : [0, 1]^n \rightarrow [0, 1]$  such that

- $\forall u \in [0, 1], C(1, \dots, u, \dots, 1) = u$ ,
- $\forall u_i \in [0, 1], C(1u, \dots, u_n) = 0$  if at least one of the  $u_i$ 's equals zero,
- $C$  is grounded and  $n$ -increasing, i.e., the  $C$ -volume of every box whose vertices lie in  $[0, 1]^n$  is positive.

The next part is to extend  $n$ -copulas to infinity-copulas which we later define.