Extremes of $\int_0^1 \int_0^1 F(x,y)\, \mathrm{d}_x \mathrm{d}_y g(x,y)$

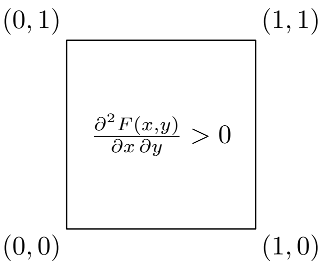
Vladimír Baláž

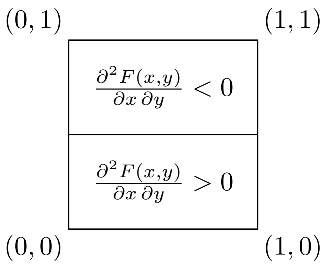
(joint work with M.R. Iacó, O. Strauch, R.F. Tichy, S. Thonhauser)

In uniform distribution theory the problem of optimizing the integral

$$\int_0^1 \int_0^1 F(x,y)\, \mathrm{d}_x \mathrm{d}_y g(x,y) \tag{1}$$

over copulas $g(x,y)$ is motivated by computing optimal limit points of the sequence $\frac{1}{N}\sum_{n=1}^{N} F(x_n,y_n)$, $N = 1,2,\dots$ over uniform distribution sequences x_n and y_n, $n = 1,2,\dots$. But problem of optimizing (1) is previously well-known as mass transportation problems. It turns out that the solution of the problem depends on sign of partial derivatives $\frac{\partial^2 F(x,y)}{\partial x\, \partial y}$. We have known a solution for the following Fig. 1 and a criterion for Fig. 2.





In this paper we solve maximum of (1) in a special Fig. 3 and a criterion for maximum in Fig. 4.