Title: Certain bivariate distributions and random processes connected with maxima and minima

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Abstract: It is well-known that \([S(x)]^n\) and \([F(x)]^n\) are the survival function and the distribution function of the minimum and the maximum of \(n\) independent, identically distributed random variables, where \(S\) and \(F\) are their common survival and distribution functions, respectively. These two extreme order statistics play important role in countless applications, and are the central and well-studied objects of extreme value theory. In this work we provide stochastic representations for the quantities \([S(x)]^\alpha\) and \([F(x)]^\alpha\), where \(\alpha > 0\) is no longer an integer, and construct a bivariate model with these margins. Our constructions and representations involve maxima and minima with a random number of terms. We also discuss generalizations to random process and further extensions. This research was carried jointly with K. Podgorski.