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Corrective to the article : Extreme Value Analysis - an Introduction Journal de la SFdS Vol. 154 No2, 66-97 *

Titre: Correctif à l'article : Introduction à l'analyse des valeurs extrêmes

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Two mistakes appears in Proposition 2.9, one is due to a typographical error in Beirlant et al. (2004). We wish to thank Yves Deville for pointing them out.

Deux erreurs sont présentes dans la proposition 2.9, dont une est due à une erreur de typographie dans Beirlant et al. (2004). Nous tenons à remercier Yves Deville pour nous les avoir signalées.

Proposition 2.9 (von Mises' Theorem)**.** *Sufficient conditions on the density of a distribution for it belongs to $\mathscr{D}(G_\gamma)$ are the following:*

(i) *Fréchet case:* $\gamma > 0$. *If* $\omega(F) = \infty$ *and* $\lim_{x\uparrow\infty} xr(x) = 1/\gamma$, *then* $F \in \mathscr{D}(G_\gamma)$,

(ii) *Gumbel case:* $\gamma = 0$. $r(x)$ *is ultimately positive in the neighbourhood of* $\omega(F)$, *is differentiable there and satisfies* $\lim_{x\uparrow\omega(F)} \frac{d}{dx}\left(\frac{1}{r(x)}\right) = 0$, *then* $F \in \mathscr{D}(G_0)$,

(iii) *Reversed Weibull case:* $\gamma > 0$. $\omega(F) < \infty$ *and* $\lim_{x\uparrow\omega(F)}(\omega(F) - x)r(x) = 1/\gamma$, *then* $F \in \mathscr{D}(G_{-\gamma})$.

The domain of attraction of Gumbel distributions covers a wide range of cdf. F, and checking the attraction condition to $\mathscr{D}(G_0)$ is often tedious. More details on the Gumbel case are available: in David and Nagaraja (2003)[Theorem 10.5.2] for a proof, in Embrechts et al. (2003)[Section 3.3.3] in which the Von Mises functions are introduced in order to characterise the distribution functions in $\mathscr{D}(G_0)$. An alternative unified formulation of Proposition 2.9 is given in Falk et al. (2011)[Theorem 2.1.2].

For instance, the Lomax distribution whose density is $f(x) = (1+x)^{-(\alpha+1)}$ with $\alpha > 0$ and $\omega(F) = \infty$ has $r(x) = \alpha/(1+x)$; this distribution belongs to the Fréchet domain and satisfies (i). Nevertheless, $r'(x) \to \infty$ as $x \to \infty$, but $(1/r(x))' = \alpha^{-1} > 0$.

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* http://journal-sfds.fr/index.php/J-SFdS/article/view/169

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References

Beirlant, J., Goegebeur, Y., Segers, J., and Teugels, J. (2004). *Statistics of Extremes: Theory and Applications*. Probability and Statistics. Wiley.

David, H. A. and Nagaraja, H. (2003). Wiley series in probability and statistics. *Order Statistics*.

Embrechts, P., Klüppelberg, C., and Mikosch, T. (2003). *Modelling Extremal Events for Insurance and Finance*, volume 33 of *Applications of Mathematics*. Springer.

Falk, M., Hüsler, J., and Reiss, R. D. (2011). *Laws of small numbers: extremes and rare events*. Birkhäuser/Springer.