國立中山大學跨領域及數據科學研究中心
國立中山大學應用數學系
學術演講

講　　者：Professor Jacek Wesołowski
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講　　題：Kummer and gamma distributions through Matsumoto-Yor type properties

時　　間：2015/11/05（星期四）14：10～15：00

地　　點：理學院四樓理 SC 4009-1 室

茶　　會：15:00 於理 SC 4010 室（系辦公室）

摘要

Koudu and Vallois (2012) looked for distributions of independent random variables X and Y and a function f having the property that f(X+Y) and f(X)-f(X+Y) are independent and related characterizations. Their starting point was the Matsumoto-Yor (MY) property, which is obtained by taking X of the GIG distribution, Y of the gamma distribution and $f(x)=1/x$. Note also that the famous Lukacs property is obtained by taking $f(x)=\log(x)$. An analogue involving Kummer and gamma distributions is when $f(x)=\log(1+1/x)$. However their characterization needed assumption of smoothness of strictly positive densities. We will show how the densities can be avoided by considering even a weaker constancy of regressions conditions. Also a characterization connected to a new MY-related independence property for Kummer and gamma laws discovered recently in Hamza and Vallois (2015) will be presented. The main issue in this context is a multivariate setting defined in terms of directed trees (an analogy to the classical MY case). More can be found in:

1. Hamza, M., Vallois, P., On Kummer's distributions od type two and generalized beta distributions, Statis. Probab. Lett. (2015) submitted.
2. Koudu, E., Vallois , P., Independence properties of the Matsumoto-Yor type. Bernoulli 18(1) (2012), 119-136.
3. Letac, G., Wesołowski, J., On an independence property for the product of GIG and Gamma laws. Annals of Probability 28 (2000), 1371-1383.
4. Massam, H., Wesołowski, J., The Matsumoto-Yor property on trees. Bernoulli 10 (2004), 685-700.
5. Piliszek, A., Wesołowski, J., Univariate and multivariate characterization of the Kummer and gamma laws, Bernoulli (2015) submitted.
6. Wesołowski, J., On the Matsumoto-Yor type regression characterization of the gamma and Kummer distributions. Statistics and Probability Letters 107 (2015), 145-149.

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