The Random Integral Representation Conjecture – A Quarter of Century Later

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School of Physical and Mathematical Sciences

In Jurek 1985 and 1988 the random integral representation conjecture was stated. It claims that (some) limit laws can be written as probability distributions of random integrals of the form $\int_{(a,b]} h(t) dY_{\nu}(r(t))$, for some deterministic functions $h$, $r$ and a Levy process $Y_{\nu}(t)$, $t \geq 0$. Here we review situations where such a claim holds true. Each theorem is followed by a remark which gives references to other related papers, results as well as some historical comments. Moreover, some open questions are stated.

Key words and phrases: Class L distributions or selfdecomposable distributions; infinite divisibility; Levy-Khintchine formula; class U distributions or s-selfdecomposable distributions; Euclidean space; Levy process; random integral; Banach space.

Speaker Biography
Zbigniew J. Jurek received his Ph.D. degree in 1977 under the supervision of Kazimierz Urbanik at the University of Wroclaw in Wroclaw, Poland. The class of s-selfdecomposable distributions from his thesis is nowadays called by some authors as the "Jurek clas U". In 1983 he got doctor of science degree (the habilitation thesis) for developing the methods of measure inequalities and random integral representation in the theory of limiting distributions. In 1993, with J. David Mason (University of Utah) he published the monograph "Operator-limit distributions in probability theory", Wiley, New York. Since 1995, he had the position of Professor of Mathematics at the University of Wroclaw. He was also Visiting Professor at University of Utah, Tufts University, Auburn University, Wayne State University, Lehigh University, Oregon State University, and at University of Mons, Belgium. Jurek’s research interest is in infinite dimensional probability, functional analysis and statistical physics (Ising models), and he has published over 70 research articles.

Host: Prof Nicolas Privault, Division of Mathematical Sciences, School of Physical and Mathematical Sciences