ID de Contribution: 4

## Invertibility of functionals of the Poisson process and applications

mercredi 22 mars 2023 11:20 (55 minutes)

Joint work with L. Coutin

Solving the SDE dX(t) = r(X(t))dt + dB(t)(1) is equivalent invert the map  $B \mapsto B(t) - \int_0^t r(B(s))ds$ . We study the analog of this problem on the Poisson space. Because of the Girsanov Theorem, it turns out that equivalent problem consists in inverting a time change.

We can then reinterpret the solution of the generalized Hawkes problem (find a self excited point process for a given compensator) as the analog to solving an SDE like (1). We then show a Yamada-Watanabe like theorem for weak and strong solutions to the Hawkes problem.

Some relationships are also established between Hawkes processes and directed transport between point processes.

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