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Anticipative direct transformations on the Poisson space. (English) Zbl 1021.60044
Ann. Inst. Henri Poincaré, Probab. Stat. 39, No. 4, 557-592 (2003).

The author considers a random transformation of Poisson distributed clouds ω in $U = [0, 1] \times (\mathbb{R}^d \setminus \{0\})$ by addition or deletion of points according to another Poisson cloud $\tilde{\omega}$ whose intensity depends itself on ω through a process $f : U \times \Omega \rightarrow \mathbb{R}_+$. Using a notion of time direction in U , this transformation gives rise to a stopped transformation Y_t at each time $t \geq 0$. It is shown that $(Y_t)_{t \in \mathbb{R}_+}$ can be represented as a Markov process with values in the set of transformations that add or remove particles in Poisson clouds, according to a suitable rate process $(h_u)_{u \in \mathbb{R}_+}$. The absolute continuity of the final transformation Y_∞ is proved when the transformed cloud is given by an adapted intensity process $f_u(\omega)$ and a possibly anticipating but finite component, which is dealt with using results of *J. Picard* [*Ann. Inst. Henri Poincaré, Probab. Stat.* 32, 509-548 (1996; [Zbl 0859.60045](#))]. Several examples of applications are considered, including the perturbation of an α -stable process by another stable process.

Reviewer: [Nicolas Privault \(La Rochelle\)](#)

MSC:

- [60H07](#) Stochastic calculus of variations and the Malliavin calculus
- [60G55](#) Point processes (e.g., Poisson, Cox, Hawkes processes)
- [60G51](#) Processes with independent increments; Lévy processes

Keywords:

[absolute continuity](#); [Lévy processes](#); [Malliavin calculus](#); [point processes](#); [random measures](#)

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