Full Bayesian inference for dependent nonparametric priors

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The construction of dependent random probability measures has become a crucial issue in Bayesian nonparametric literature during the last decades. Completely random measures (CRMs) are suitable mathematical tools to define large classes of dependent nonparametric priors tailored for heterogeneous observations. Here we focus on different classes of dependent priors having additive, nested and hierarchical structures. We clarify how the use of CRMs allows for a comprehensive Bayesian analysis of the proposed models, indeed we are able to derive tractable expressions for both predictive and posterior distributions of the random probability measures. Our theoretical findings form the backbone to develop new computational procedure which will be employed to address full Bayesian inference in density estimation, survival analysis, etc.