

# MULTIPARAMETER MARTINGALE APPROXIMATION AND BAKER SEQUENCES

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For a class of random fields (which are Markov in some sense) we show how the solvability of a higher analogue of the Poisson equation implies a kind of martingale/coboundary representation. The latter can be used, like in the one-parameter setting, to reduce the central limit problem to the case of (multiparameter) martingale differences. While in general the choice of the definition of multiparameter martingale differences can be discussed, here we are led to a unique version of it compatible with the situation we are interested in. As an application (developed in collaboration with Michel Weber, IRMA, Strasbourg) we consider an alternative approach to a problem originated in metric number theory and treated before by means of different methods.