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Willi Freeden* (freeden@rhrk.uni-kl.de), Department of Mathematics, University of Kaiserslautern, 67653 Kaiserslautern, RP, Germany. *Lattice Point Identities, Shannon Sampling, and Antenna Problem.*

This talk demonstrates that Shannon-type sampling can be associated to newly-created types of Hardy-Landau lattice point identities of analytic number theory which, in the language of sampling, give a deepened insight, e.g., into over- and undersampling and the explicit representation of the aliasing error. Moreover, the reproducing kernel Paley-Wiener Hilbert space context resulting from the multivariate Shannon-type sampling theorem is discussed to handle the multivariate inverse antenna problem. The roots of this talk are twofold: (i) the work on multi-dimensional generalizations of the Euler summation formula to elliptic partial differential operators and adapted multi-dimensional Poisson summation formulas over potato-like regions and their application in number theory (W. Freeden, *Metaharmonic Lattice Point Theory*. CRC Press, Boca Raton, 2011) (ii) the work on multi-dimensional lattice point Shannon-type sampling and the application to the antenna problem (W. Freeden, M.Z. Nashed, *Lattice Point Identities and Shannon-Type Sampling*. CRC Press, Boca Raton, 2019). (Received September 13, 2019)