ROBERT MARTIN, University of Waterloo, Waterloo, ON N2L 3G1 On the relationship between discrete and continuous representations of quantum information

In classical information theory, sampling theory provides the connection between discrete and continuous representations of information. Here we present a generalization to quantum field theory in which the bandwidth is provided by an ultra-violet cutoff. We investigate, in particular, the role of quantum fluctations as noise and implications for the channel capacity.