Ultraviolet Renormalization of the Nelson Model through functional Integral

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This is a joint work with M. Gubinelli and J. Lorinczi. The Nelson model in QFT was introduced by Edward Nelson at 1964. The Nelson model is defined as a self-adjoint operator on a Hilbert space by imposing a UV cutoff. He succeeded to remove the UV cutoff by an operator theory and defined a self-adjoint operator without UV cutoff on the original Hilbert space. In my talk we also remove UV cutoffs but by functional integrations. A renormalization term is derived from the diagonal part of an pair interaction and the existence of a UV-renormalized self-adjoint operator is proven by showing a uniform lower bound.