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The renormalization technique has played an important role in quantum field theory and has been object of several mathematical investigations. Recently the attempt to extend both classical and quantum stochastic calculus to higher powers of white noise has led to a new renormalization scheme, which could be called "multiplicative", as opposed to the usual subtraction scheme of divergent quantities. The new approach allows to find generalized commutation relations for the renormalized square of white noise and an Hilbert space realization of them. This turns out to be related to the current representations of the Lie algebra of $SL(2, R)$ and the solution of the corresponding cohomological problem allows to obtain a full classification of them as well as the explicit form of the vacuum distribution of the field (the sq of a complex gamma function) and of the associated "square of Poisson process" which turns out to be a χ^2 with parameter depending on the representation. The Ito table for the renormalized square of white noise has been the object of a recent paper with H.H.Huo and T. Hida and will be discussed in connection with the problem of finding unitarity conditions for solutions of stochastic equations driven by the square of white noise. (Received October 02, 2000)