DIRECTED POLYMER IN RANDOM ENVIRONMENT WITH SPATIAL CORRELATION

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Abstract: We consider the limit behavior of partition function of directed polymers in random environment represented by linear model instead of a family of i.i.d. variables in $1+1$ dimensions. Under the assumption that the correlation decays algebraically, using the method developed in [Ann. Probab., 42(3):1212-1256, 2014], under a new scaling we show the scaled partition function as a process defined on $[0,1]\times\mathbf{R}$, converges weakly to the solution to some stochastic heat equations driven by fractional Brownian field. The Hurst parameter is determined by the correlation exponent of the random environment. Here multiple Itô integral with respect to fractional Gaussian field and spectral representation of stationary process are heavily involved.