DNA unzipping and the unbinding of directed polymers in a random media YARIV KAFRI, Technion, ANATOLI POLKOVNIKOV, Boston University — We consider the unbinding of a directed polymer in a random media from a wall in $d = 1 + 1$ dimensions and a simple one-dimensional model for DNA unzipping. Using the replica trick we show that the restricted partition functions of these problems are *identical* up to an overall normalization factor. Our finding gives an example of a generalization of the stochastic matrix form decomposition to disordered systems; a method which effectively allows to reduce the dimensionality of the problem. The equivalence between the two problems, for example, allows us to derive the probability distribution for finding the directed polymer a distance z from the wall. We discuss implications of these results for the related Kardar-Parisi-Zhang equation and the asymmetric exclusion process.

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