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## Relevance of disorder for the pinning model in dimension $(1 + 1)$

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Consider a directed walk in dimension  $(1 + 1)$ , which interacts with a one-dimensional defect via a quenched disordered potential. The walk undergoes a localization/delocalization transition, and the main question is whether the critical point and the associated critical exponents coincide or not with those of the corresponding annealed model. Contradictory predictions exist in the physics literature. We prove the conjecture by Derrida et al that the two critical points differ for every disorder strength  $\Delta > 0$ , and that their difference behaves approximately like  $\exp(-c/\Delta)$ .

*This is joint work with G. Giacomin and H. Lacoin.*