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**Temperature dependence of two distinct DNA overstretching transitions** XINGHUA ZHANG, BioSyM, SMART, HONGXIA FU, Mechanobiology Institute, Singapore, National University of Singapore, PATRICK DOYLE, Department of Chemical Engineering, MIT, JIE YAN, Mechanobiology Institute, Singapore, National University of Singapore; Department of Physics, National University of Singapore — Recent experiments show that two distinct transitions are involved in the DNA overstretching that occurs at around 65 pN: a strand-unpeeling transition leading to strand separation from free DNA ends or nicks, and a B to S transition leading to an overstretched double-stranded DNA called “S-DNA.” Here we show that the two transitions have distinct temperature dependence: in the strand-unpeeling transition, the transition force decreases when the temperature increases; while in the B to S transition, the temperature dependence of the transition force is opposite. Our results are in agreement with the notion that the two transitions involve distinct types of double-helix reorganization.

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