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The Peyrard-Bishop-Dauxois Model of DNA Dynamics BOIAN ALEXANDROV, ALAN BISHOP, Los Alamos National Laboratory, ANNY USHEVA, Harvard Medical School, KIM RASMUSSEN, Los Alamos National Laboratory — This presentation details aspects of the rapid development of the connection between the dynamics of double strand DNA, and experimental findings that has occurred in the recent years. We will approach this topic by demonstrating the Peyrard-Bishop-Dauxois model's ability to provide useful insight on several experimental observations. Specifically, we will discuss the melting behavior of various DNA sequences, and mechanical unzipping through dynamic force spectroscopy. Focusing on viral transcription initiation we will further show how the connection between DNA dynamics and DNA's biological functionality is becoming increasingly strong. Finally, we will describe a probable connection between DNA dynamics and the ability of repair proteins to recognize UV-radiation damages.

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