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Polymer dynamics and stress transmission at polymer interfaces

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End tethered polymer chains have been recognized to be excellent adhesion promoters at polymer or are known to be able to modify the friction at interfaces. In this talk, we will present 3 related sets of experiments on the dynamics of polymer close to an interface. We will present results of polymer chains in contact with a melt, in contact with an elastomer and in contact with a solvent. In a first part, we will present neutron reflectivity experiments characterizing the density profiles and dynamics of interdigitation between H-PS brushes, in contact with d-PS thick layers, heated above their glass transition temperature. This interdigitated brushes will be shared and disentangled from the melt leading to a large slip at the interface. The density profiles of the sheared brushed will be presented. In a second part we will present some friction measurement at a PDMS chains – PDMS elastomer interface and we will show that the grafted chains penetration and dynamics allows to control the friction at such elastomer interfaces. Finally we shall present some measurements of the mechanical response of the swollen PDMS chains using nanorheology experiments and we will evidence the role of the confining surfaces in the measurements.