

Sliding friction over and between sand layers is relevant for many problems ranging from civil engineering to earthquake dynamics. In many practical situations, small amounts of water may be present. Ancient Egyptian tomb drawings suggest that wetting the sand with water may influence the friction between a sled and the sand, although the significance of the person wetting the sand has been much disputed. In this talk, I will explain about the sliding friction on sand which is greatly reduced by the addition of some water. The formation of capillary water bridges increases the shear modulus of the sand, which facilitates the sliding. Too much water, on the other hand, makes the capillary bridges coalesce, resulting in a decrease of the modulus. Our results, therefore, show that the friction coefficient is directly related to the shear modulus; this has important repercussions for the transport of granular materials. In addition, the polydispersity of the sand is shown to also have a large effect on the friction coefficient.