Abstract Submitted
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A QCM study of the dynamics and frictional properties of physisorbed polystyrene microspheres on a AU(111) Surface[1] IYAM LYNCH, JACQUELINE KRIM, North Carolina State University, JESSICA MCNUTT, University North Carolina Asheville — The notion of transporting micro/nano objects has been of interest to the scientific community since the early days of nanotechnology. Progress in this area requires an understanding of the frictional behavior of these objects when they are in motion. In this study we have analyzed the behavior of 5μm diameter polystyrene spheres physisorbed on the electrode of a quartz crystal microbalance (QCM) in orientations normal and parallel to gravity. By varying the driving voltage of the QCM, the samples exhibit a frequency response with respect to the crystal amplitude ("decoupling curve"). This decoupling curve gives information about the motion of the spheres on the surface and leads to the calculation of the particles sliptime which gives rise to the frictional force between the particles and surface. Optical observations show that the particle motion is dependent on the oscillation direction of the QCM and gravity to a lesser extent. Quantitative comparisons of the friction force and the optically observed sliding motion have been performed and will be reported on.

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