## [P30] An experimental test of the Jarzynski equality by pulling a colloidal particle using an optical tweezers

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Jarzynski equality was tested by pulling a single colloidal particle with an optical tweezers. Intially the particle was in equillibrium inside the trap. Then the particle was pulled through solution by the optical trap translating at constant velocity in one direction. It was observed that after a certain relaxation time, the particle moved in average with the same moving speed and with the average position a little behind the optical trap center. When the trap strength was increased, the relaxation time became shorter and the average position of the particle was closer to the trap center. The results of the experimental measurements of the work($W$) during the pulling process agreed with the Jarzynski equality during the initial short time period for three different optical trap strengths, but not during the late time period. We believe that this disagreement at the late time period is originated due to the very rare events which dominate the ensemble average of $\exp(-\beta W)$.