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High-speed AFM and the reduction of tip-sample forces MERVYN MILES, RAVI SHARMA, LOREN PICCO, Univ of Bristol — High-speed DC-mode AFM has been shown to be routinely capable of imaging at video rate, and, if required, at over 1000 frames per second. At sufficiently high tip-sample velocities in ambient conditions, the tip lifts off the sample surface in a superlubricity process which reduces the level of shear forces imposed on the sample by the tip and therefore reduces the potential damage and distortion of the sample being imaged. High-frequency mechanical oscillations, both lateral and vertical, have been reported to reduced the tip-sample frictional forces. We have investigated the effect of combining linear high-speed scanning with these small amplitude high-frequency oscillations with the aim of reducing further the force interaction in high-speed imaging. Examples of this new version of high-speed AFM imaging will be presented for biological samples.

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