Development of tip Scanning High Speed AFM operating at 1,000 Lines/s & 15m

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High speed atomic force microscope allows imaging dynamic processes on the surfaces. We have developed a very high speed tip scanning atomic force microscope (HS-AFM). We designed the tip scanning system to overcome the sample size limits, with a beam tracking capability to follow the cantilever motion. A high resonance frequency flexure scanner developed which has 15m scan range in XY and 3m in Z axis. A novel FPGA based high speed scanning and data acquisition system was developed. The scanner is driven by sine wave in X-axis to avoid resonances and data were captured at equal sample intervals. 1 KHz line scan rate is achieved at 15m scan range with the HS-AFM.

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