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Detection and Analysis of Quantum Dots from Atomic Force Microscope Images STEPHEN POPROCKI, The College of Wooster, LEANN ERBSEN, Guilford College, SUSAN LEHMAN, The College of Wooster — On-surface self-assembled quantum dots (QDs) are routinely studied by atomic force microscopy (AFM) to characterize the size and number density of the QDs and to better understand the strain-induced process of self-assembly. However, the analysis of dot height and location is complicated by the difficulty of accurate detection and analysis of the QDs from the AFM image, particularly for samples with a varying background. We have developed a custom program to quickly and accurately locate both dot maxima and dot edges. In addition to eliminating the counting of false dots and the missed counting of real dots, the program measures the height of individual dots from a local background rather than an average background. Results from this new program are compared to those from previous analysis techniques. Sample measurements of QD height and surface density for InAs QDs on GaAs and the uniformity of these dot characteristics across the wafer will also be presented.

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