Automated Analysis of Nanocar Molecules as Observed by VT-STM. A. J. OSGOOD, Department of Electrical and Computer Engineering, T. SASAKI, J. M. TOUR, Department of Chemistry, K. F. KELLY, Department of Electrical and Computer Engineering — The observation and measurement of individual nanocar molecules by variable temperature scanning tunneling microscopy (STM) has uncovered a great deal of information regarding their electronic properties and dynamic abilities. While STM is particularly powerful in measuring the properties of individual molecules, it is often desirable and enlightening to obtain information of the ensemble as well. Many groups have previously worked on the automatic detection and recognition of molecules in STM images, however, the complex 4-lobed nature of the nanocar introduces additional challenges. Therefore, we have developed an automated image processing routine that is more robust and able to overcome these problems. We then apply this to the analysis of nanocars imaged by STM at various temperatures and demonstrate the recognition of spinning vs. stationary fullerene wheels on the nanocar molecules by correlating the rotational state with observed changes in their electronic properties.

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