III-2 2:12 p.m.-2:22 p.m.

AN EFFICIENT, WAVELET-BASED APPROACH TO THE SOLUTION OF SCHRÖDINGER'S EQUATION

Jason P. Modisette and Peter Nordlander
Department of Physics

Compactly-supported wavelets have many applications in analysis and signal processing. Recently, they have also been applied to differential and integral equations, since many operators are sparse when represented in bases of these functions. Using a wavelet basis to solve Schrödinger's equation for a molecule or cluster has many advantages over conventional techniques. I will discuss our work on applying recently published fast algorithms to the generation of matrix elements in bases of compactly supported wavelets with an eye towards future use of these methods in density functional theory electronic structure calculations for large molecules and clusters.

III-3 2:24 p.m.-2:34 p.m.

ADHESION TESTING OF THIN-FILM METALLIZATIONS

Matthew T. Currie, Alfred J. Griffin, Jr., Clyde F. Dunn,* and Franz R. Brotzen
Department of Mechanical Engineering and Materials Science

A novel electrostatic instrument has been developed for measuring the adhesion strength of thin-film metallizations deposited on single-crystal Si substrates. The goal of this non-contact instrument is the quantitative measurement of thin-film adhesion strength without the problems inherent in traditional methods. Preliminary results indicate a qualitative difference between the adhesion strength of Al on Si and Cu on Si, the former displaying greater adhesion, as expected. Different design and testing configurations, as well as the preliminary results, will be presented.

*Texas Instruments, Inc., Houston, Texas.

III-4 2:36 p.m.-2:46 p.m.

INTERFEROMETRIC STUDY OF SURFACE DISPLACEMENT UPON NANOSECOND LASER ABLATION OF AQUEOUS MEDIA*

Rinat O. Esenaliev, Alexander A. Oraevsky, Steven L. Jacques,[1] and Frank K. Tittel
Department of Electrical and Computer Engineering

One of the most precise methods for tissue removal in medical practice is the pulsed laser ablation. This method was successfully applied in ophthalmology and microsurgery of delicate human organs. Recently, we employed nanosecond laser irradiation to demonstrate the accuracy of biological tissue ablation at subcellular level without thermal and mechanical damage to adjacent layers. Detailed qualitative and quantitative description of the ablation mechanisms