Electron Transport through Models for Small-World Nanomaterials\textsuperscript{1} LAZARUS SOLOMON, MARK NOVOTNY, Mississippi State University — We investigate the quantum transport of (spinless) electrons through simplified models related to small-world nanomaterials. We employ a tight-binding Hamiltonian, and obtain the transmission coefficient from a matrix solution of the associated time-independent Schrödinger Equation. The system studied corresponds to $d = 1$ semi-infinite input and output leads, connected to a ‘blob’ of $N$ atoms. We first present exact results for $N$ inter-connected atoms, a fully-connected graph. The exact solution, for any $N$, is given both for symmetric and non-symmetric connections between the ‘blob’ and the input/output. We then present numerical results obtained by removing some of the connections within the $N$-site ‘blob’, thereby approaching transport through a small-world nanomaterial \cite{1-4}.

\begin{thebibliography}{9}
\bibitem{4} J. Yancey, M.A. Novotny, and S.R. Gwaltney, 2008 March Meeting presentation.
\end{thebibliography}

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