Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Electronic properties of a coupled polyacetylene chain RAIMUNDO COSTA, University of Western Ontario, CELIO MUNIZ, Universidade Estadual do Ceara — We study a coupled polyacetylene chain using a theoretical field formalism and verify that this structure presents a gap in its band structure. This energy gap is calculated in terms of a quantized effective mass that depends on the coupling between the polyacetylene chains. As the coupling decreases the gap vanishes and we can restore the previous results of one single polyacetylene chain. We show that there is a chiral broken symmetry. Electrons propagating in one direction are more energetic than electrons propagating in the other direction of the chain. A formalism is developed to show that there is a particle oscillation phenomenon analogous to Bloch oscillations. The conductivity of the system is also calculated.

Raimundo Costa
University of Western Ontario

Date submitted: 21 Nov 2008 Electronic form version 1.4