Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Nuclear Polarisation in Quantum Wires ANSON CHEUNG, Theory of Condensed Matter, Cavendish Laboratory, 19 J.J. Thomson Avenue, Cambridge CB3 0HE, UK, V. TRIPATHI, Department of Theoretical Physics, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai 400005, India — We consider the intriguing possibility that current flow within a quantum wire can produce nuclear polarisation. The quantum wire is special because electrons can only move along one direction. Also, because of its heterogeneous structure, spin-orbit effects come into play. Together, this means that electrons are only permitted to have spin up or down orientations within the wire. By exploiting this and the Overhauser effect, we calculate the degree of nuclear polarisation and the electronic conductance arising from the effect of a non-equilibrium current.

Anson Cheung
Theory of Condensed Matter, Cavendish Laboratory,
19 J.J. Thomson Avenue, Cambridge CB3 0HE, UK

Date submitted: 13 Dec 2006 Electronic form version 1.4