## Abstract Submitted for the MAR07 Meeting of The American Physical Society

Nanocables made of a transition metal wire and boron nitride<sup>1</sup> CHIH-KAI YANG, Chang Gung University, Kueishan 333, Taiwan, ROC, JIJUN ZHAO, Dalian University of Technology, Dalian, China 116024, JIANPING LU, Department of Physics & Astronomy, University of North Carolina, Chapel Hill, NC 27599-3255 — The boron nitride (BN) nanotube has a very wide band gap and can shield the nanowire encapsulated inside its cavity from outside interference. Our calculations indicate that transition metal wires can be inserted inside a variety of zigzag BN nanotubes exothermically. In particular a cobalt wire and the BN tube interact just like two giant molecules. The weak interaction between the BN tube and the wire ensures a low binding energy and a high magnetic moment that comes solely from the transition metals. High spin polarization at the Fermi level also indicates that the hybrid structure can be used as a nanocable for spintronic applications

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