Title:

Superconductivity and magnetism in amorphous carbon

Abstract:

Recent reports on the superconductivity in a new form of amorphous carbon (Q-carbon) have attracted much interest because of their high superconducting transition temperatures (36 K and 55 K at 17 % and 27 % boron doping) [1, 2]. We examine the effect of boron doping in superconducting forms of amorphous carbon. We confirm the superconductivity in amorphous carbon with various mass densities, boron concentration, and amorphous structures [3, 4]. Our findings have direct implications for understanding the high-Tc superconductivity in Q-carbon. Q-carbon is also reported as a ferromagnetic pure carbon material [5]. We show the existence of threefold-coordinated carbon atoms are important for causing magnetism [6]. We also predict possible geometries that induce magnetic orders in amorphous carbon.

References:

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